MATCO TOOLS

Enhanced Scan**Advisor**™

Part Number

MD1072

Owner's Manual

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SAFETY FIRST!

Always read the vehicle's service manual and follow its safety precautions before and during any test or service procedure. **ALWAYS** observe the following general safety precautions:

When an engine is running, it produces carbon monoxide, a toxic and poisonous gas. To prevent serious injury or death from carbon monoxide poisoning, operate the vehicle **ONLY** in a **well-ventilated** area.

To protect your eyes from propelled objects as well as hot or caustic liquids, **always** wear **approved** safety eye protection.

When an engine is running, many parts (such as the coolant fan, pulleys, fan belt etc.) turn at high speed. To avoid serious injury, always be aware of moving parts. Keep a safe distance from these parts as well as other potentially moving objects.

Engine parts become very hot when the engine is running. To prevent severe burns, avoid contact with hot engine parts.

Before starting an engine for testing or troubleshooting, make sure the parking brake is engaged. Put the transmission in **park** (for automatic transmission) or **neutral** (for manual transmission). Block the drive wheels with suitable blocks.

Connecting or disconnecting test equipment when the ignition is **ON** can damage test equipment and the vehicle's electronic components. Turn the ignition **OFF** before connecting the Scan Tool to or disconnecting the Scan Tool from the vehicle's Data Link Connector (DLC).

To prevent damage to the on-board computer when taking vehicle electrical measurements, always use a digital multimeter with at least 10 megOhms of impedance.

Fuel and battery vapors are highly flammable. To prevent an explosion, keep all sparks, heated items and open flames away from the battery and fuel / fuel vapors. DO NOT SMOKE NEAR THE VEHICLE DURING TESTING.

Don't wear loose clothing or jewelry when working on an engine. Loose clothing can become caught in the fan, pulleys, belts, etc. Jewelry is highly conductive, and can cause a severe burn if it makes contact between a power source and ground.

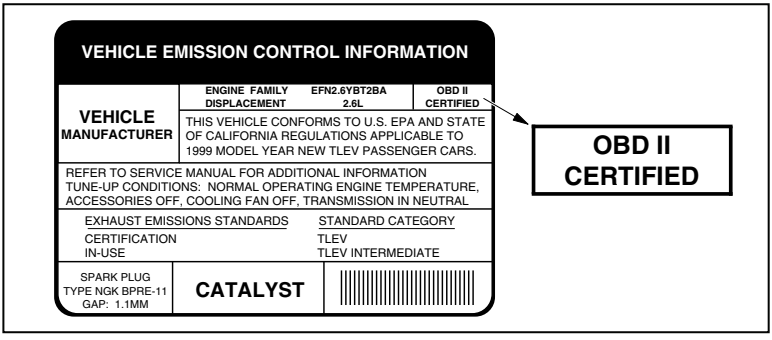
VEHICLES COVERED

The Scan Tool is designed to work on all OBD2 compliant vehicles. All 1996 and newer vehicles (cars and light trucks) sold in the United States are OBD2 compliant.

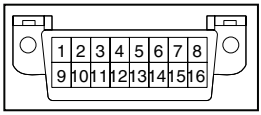
Federal law requires that all 1996 and newer cars and light trucks sold in the United States must be OBD2 compliant; this includes all Domestic, Asian and European vehicles.

Some 1994 and 1995 vehicles are OBD2 compliant. To determine if a 1994 or 1995 vehicle is OBD2 compliant, check the following:

1. **The Vehicle Emissions Control Information (VECI) Label**. This label is located under the hood or by the radiator of most vehicles. If the vehicle is OBD2 compliant, the label will state "**OBD II Certified**."



2. Government Regulations require that all OBD2 compliant vehicles **must** have a "common" sixteen-pin **Data Link Connector (DLC)**.

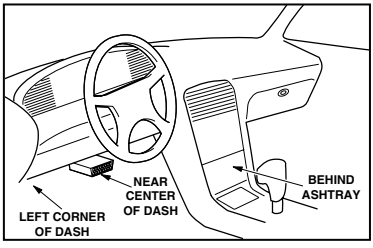


Some 1994 and 1995 vehicles have 16-pin connectors but are not OBD2 compliant. Only those vehicles with a Vehicle Emissions Control Label stating "OBD II Certified" are OBD2 compliant.

The Scan Tool is also compatible with many Chrysler, Ford, GM and Toyota vehicles equipped with OBD1 systems.

Data Link Connector (DLC) Location

The 16-pin DLC is usually located under the instrument panel (dash), within 12 inches (300 mm) of center of the panel, on the driver's side of most vehicles. It should be easily accessible and visible from a kneeling position outside the vehicle with the door open.



On some Asian and European vehicles the DLC is located behind the "ashtray" (the ashtray must be removed to access it) or on the far left corner of the dash. If the DLC cannot be located, consult the vehicle's service manual for the location.

BATTERY REPLACEMENT

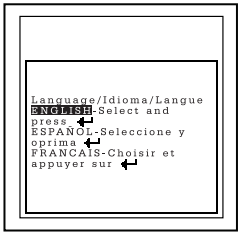
Replace batteries when the battery symbol is visible on display and/or the 3 LEDS are all lit and no other data is visible on screen.

1. Locate the battery compartment cover on the back of the Scan Tool.
2. Remove the screw securing the battery compartment cover, and remove the cover.
3. Replace batteries with six AAA-size batteries (for longer life, use Alkaline-type batteries).
4. Reinstall the battery compartment cover on the back of the Scan Tool and secure in place with the screw.

Adjustments After Battery Installation

The first time the Scan Tool is turned on, you must select the desired display language (English, French or Spanish) and unit of measurement (USA or metric) as follows:

1. Press and hold the **POWER/LINK** button for approximately 3 seconds to turn the Scan Tool "ON."
   - The Select Language screen displays.



2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired display language.
3. When the desired display language is selected, press the **ENTER** button to confirm your selection.
   - The display shows the "Welcome" message in the selected display language.
   - After the initial language selection is performed, it as well as other settings can be changed as desired. See ADJUSTMENTS AND SETTINGS on page 4 for further instructions.

   - If data is currently stored in the Scan Tool's memory, you can view the stored data if desired. See VIEWING DATA IN MEMORY on page 161 for further instructions.
   - Press the **POWER/LINK** button to turn the Scan Tool "OFF."

ADJUSTMENTS AND SETTINGS

The Scan Tool lets you make several adjustments and settings to configure the tool to your particular needs. It also contains an OBD2 DTC Library that allows you to search for DTC definitions. The following functions, adjustments and settings can be performed when the Scan Tool is in "MENU Mode":

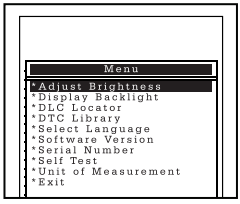
- **Adjust Brightness**: Adjusts the brightness of the display screen.
- **Display Backlight:** Turns the display backlight on and off.
- **DLC Locator:** Directory of Data Link Connector (DLC) locations for domestic, Asian and European vehicles, 1996 to 2008.
- **DTC Library** - Library of OBD2 DTC definitions.
- **Select Language**: Sets the display language for the Scan Tool to English, French or Spanish.
- **Software Version:** Displays the Scan Tool's software versions.
- **Serial Number:** Displays the Scan Tool's serial number.
- **Self Test:** Displays the Self Test menu from which you can choose to perform several tests of the Scan Tool's functionality.
- **Unit of Measurement**: Sets the Unit of Measurement for the Scan Tool's display to USA or metric.

Adjustments and settings can be made only when the Scan Tool is NOT connected to a vehicle.

To enter the MENU Mode:

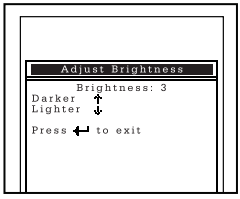
1. Press and hold both the **ENTER** ↵ button and the **POWER/LINK** ⏻ button for approximately 5 seconds to turn the Scan Tool "ON."
   - The **Set Up Menu** displays.
2. Make adjustments and settings as described in the following paragraphs.

Adjusting Display Brightness



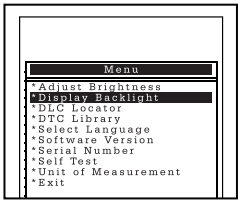
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Adjust Brightness** in the **Menu**, then press the **ENTER** ↵ button.
   - The Adjust Brightness screen displays.
   - The **Brightness** field shows the current brightness setting, from 0 to 30.
2. Press the **UP** ▲ button to decrease the brightness of the display (make the display darker).

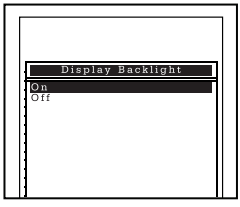
3. Press the **DOWN** ▼ button to increase the brightness of the display (make the display lighter).
4. When the desired brightness is obtained, press the **ENTER** ↵ button to save your changes and return to the **Menu**.



Using the Backlight

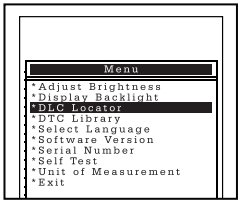
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Display Backlight** in the **Menu**, then press the **ENTER** ↵ button.
   - The Display Backlight screen displays.
2. Press the **UP** ▲ or **DOWN** ▼ button, as necessary, to select the desired backlight mode, either **ON** or **OFF**.
3. When the desired backlight mode is selected, press the **ENTER** ↵ button to save your changes.
   - The display returns to the **Menu**, and the backlight turns “on” or “off” as selected.

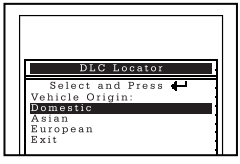




Using the DLC Locator

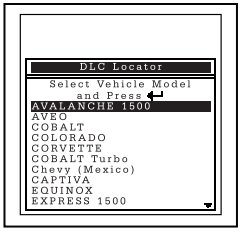
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **DLC Locator** in the **Menu**, then press the **ENTER** ↵ button.
   - The Select Vehicle Origin screen displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle origin, then press the **ENTER** ↵ button.
   - The Select Vehicle Make screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

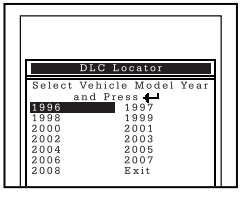


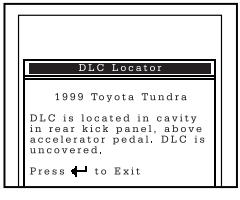


- The Select Vehicle Model Year screen displays.

4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.
   - The Select Vehicle Model screen displays.
5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired model year, then press the **ENTER** ↵ button.
   - The DLC Location screen for the selected vehicle displays.
   - The DLC Location screen shows the selected vehicle make and model, a description of the DLC location, and whether the DLC is "covered" or "uncovered."
6. When you have finished viewing the DLC location, press the **ENTER** ↵ button to return to the Menu.

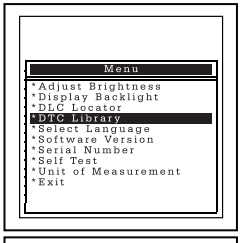


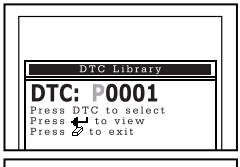


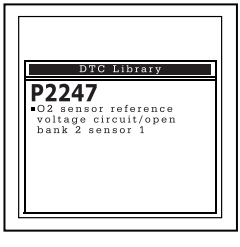

DLC Locator
1999 Toyota Tundra
DLC is located in cavity in rear kick panel, above accelerator pedal. DLC is uncovered.
Press ↵ to Exit

Searching for a DTC Definition Using the DTC Library

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **DTC Library** in the **Menu**, then press the **ENTER** ↵ button.
   - The Enter DTC screen displays. The screen shows the code "P0001", with the "P" flashing.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll to the desired DTC type (P=Powertrain, U=Network, B=Body, C=Chassis), then press the **DTC** button.
   - The selected character displays "solid", and the next character begins flashing.
3. Select the remaining characters in the DTC in the same way, pressing the **DTC** button to confirm each character. When you have selected all the DTC characters, press the **ENTER** ↵ button to view the DTC definition.
   - If you entered a "Generic" DTC (DTCs that start with "P0", "P2" and some "P3"):







- The selected DTC and DTC definition (if available) show on the Scan Tool's display.

If a definition for the DTC you entered is not available, an advisory message shows on the Scan Tool's display.

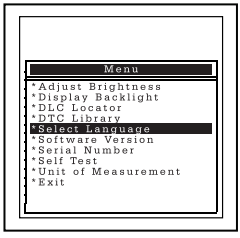
- If you entered a "Manufacturer-Specific" DTC (DTCs that start with "P1" and some "P3"):
  - The Select Manufacturer screen displays.
  - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the appropriate manufacturer, then press the **ENTER** ↵ button to display the correct DTC for your vehicle.

If a definition for the DTC you entered is not available, an advisory message shows on the Scan Tool's display.

4. If you wish to view definitions for additional DTCs, press the **ENTER** ↵ button to return to the Enter DTC screen, and repeat steps 2 and 3.
5. When all desired DTCs have been viewed, press the **BI-DIRECTIONAL TEST** ⇌ button to exit the DTC Library.

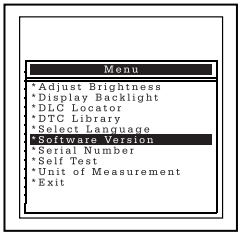
Selecting the Display Language

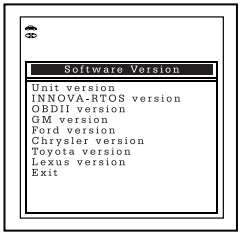
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Select Language** in the **Menu**, then press the **ENTER** ↵ button.
   - The Select Language screen displays.
   - The currently selected display **Language** is highlighted.
2. Press the **UP** ▲ or **DOWN** ▼ button, as necessary, to highlight the desired display language.
3. When the desired display language is highlighted, press the **ENTER** ↵ button to save your changes and return to the **Menu** (shown in the selected display language).



Viewing the Software Version

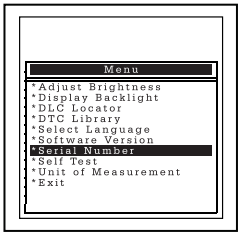
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Software Version** in the **Menu**, then press the **ENTER** ↵ button.
   - The Software Version screen displays.
   - The screen shows the Scan Tool's current software versions.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view scroll the display.
3. When you have finished viewing the software version information, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the **Menu**.

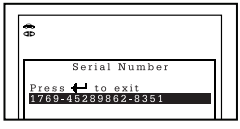




Viewing the Serial Number

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Serial Number** in the **Menu**, then press the **ENTER** ↵ button.
   - The Serial Number screen displays.
   - The screen shows the Scan Tool's serial number.
2. Press the **ENTER** ↵ button to return to the Menu.

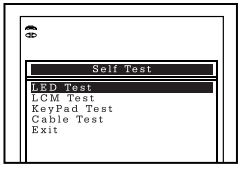




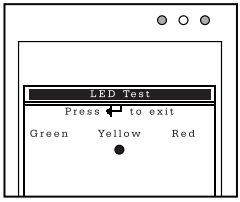
Performing the Scan Tool Self Tests

The Scan Tool includes several tests that can be used to ensure the hardware is functioning properly.

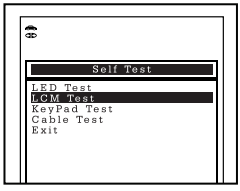
1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Self Test** in the **Menu**, then press the **ENTER** ↵ button.
   - The Self Test Menu displays.
2. To perform the LED Test:
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **LED Test** in the **Self Test Menu**, then press the **ENTER** ↵ button.



- The LED Test screen displays.



- Verify the green, yellow and red LEDs blink in sequence, and "Green," "Yellow" and "Red" icons on the LCD blink in unison with the associated LEDs.
- Press the **ENTER** ↵ button to return to the **Self Test Menu**.

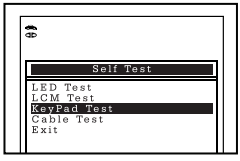


3. To perform the LCM Test:

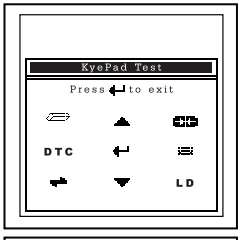
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **LCM Test** in the **Self Test Menu**, then press the **ENTER** ↵ button to begin the test.
  - The LCD display illuminates and extinguishes each display element (icons, numeral segments, etc.) in the upper section of the display, then illuminates and extinguishes all pixels (as a group) in the lower section of the display.
- Verify that all display elements illuminate properly, and that no elements are always "on" or always "off."
- Press the **ENTER** ↵ button to return to the **Self Test Menu**.

4. To perform the Keypad Test:

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Keypad Test** in the **Self Test Menu**, then press the **ENTER** ↵ button.
  - The Keypad Test screen displays.

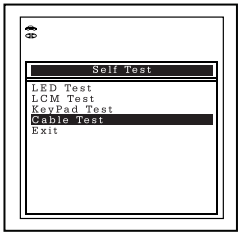


- Press each keypad button and verify the associated icon on the LCD display flashes.
- Press the **ENTER** ↵ button to return to the **Self Test Menu**.

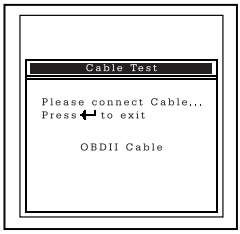


5. To perform the Cable Test:

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Cable Test** in the **Self Test Menu**, then press the **ENTER** ↵ button.
  - The Cable Test screen displays. With no cable connected to the Scan Tool, verify the screen shows the message "Empty Cable."

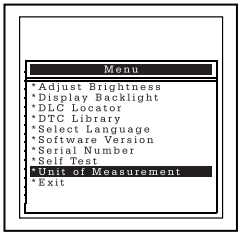


- Connect a cable to the Scan Tool. Verify the screen shows the type of cable connected to the tool.
- Press the **ENTER** ↵ button to return to the **Self Test Menu**.

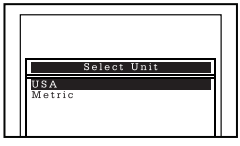


6. To exit the Self Test, the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit** in the **Self Test Menu**, then press the **ENTER** ↵ button.
   - The screen returns to the Set Up **Menu**.

Setting the Unit of Measurement



1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Unit of Measurement** in the **Menu**, then press the **UP** ▲ and **DOWN** ▼ button.
2. Press the **UP** ▲ or **DOWN** ▼ button, as necessary, to highlight the desired **Unit of Measurement**.
3. When the desired **Unit of Measurement** value is selected, press the **ENTER** ↵ button to save your changes and return to the **Menu**.



Exiting the MENU Mode

1. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button.
   - The LCD display returns to the "To Link" screen.

CONTROLS AND INDICATORS

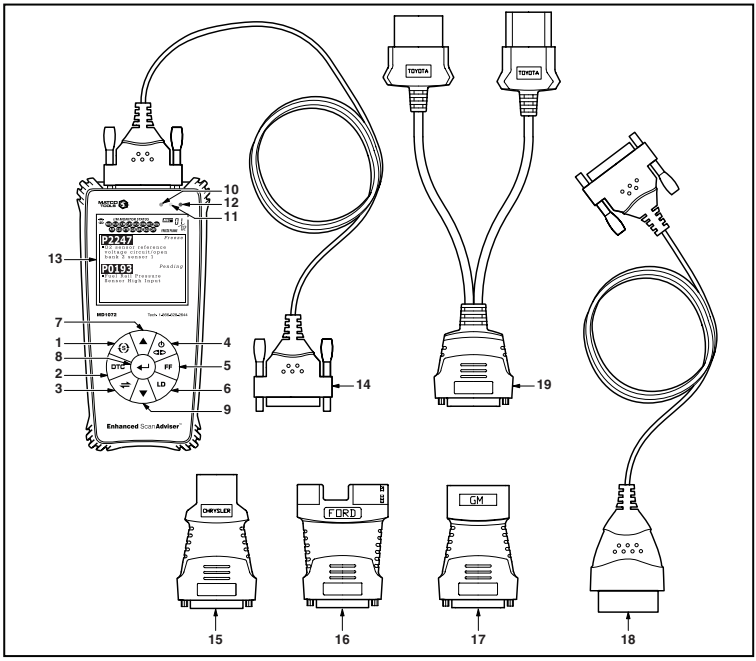


Figure 1. Controls and Indicators

See Figure 1 for the locations of items 1 through 16, below.

1. **SYSTEM TEST Ⓢ button** – Displays the system test menu for the current vehicle.
2. **DTC** (DTC) button - Displays the DTC View screen.
3. **BI-DIRECTIONAL TEST ⇌ button** – Displays the bi-directional test menu for the current vehicle.
4. **⏻ POWER/LINK** button - When the Scan Tool IS NOT connected to a vehicle, turns the tool "**On**" and "**Off**". When the Scan Tool is connected to a vehicle, links the tool to the vehicle's PCM to retrieve diagnostic data from the computer's memory. (The LINK function is applicable to OBD2 systems only.)

   *To turn the Scan Tool "On", you must press and hold the **POWER/LINK** button for approximately 3 seconds.*

5. **FF** (Freeze Frame) button – Displays Freeze Frame data.
6. **LD** (Live Data) button – Places the Scan Tool in "Live Data" mode.

7. ▲ **UP button** - When in MENU mode, scrolls UP through the menu and submenu selection options. When retrieving and viewing DTCs, scrolls ups through the current display screen to display any additional data.

8. ↵ **ENTER button** - When in MENU mode, confirms the selected option or value.

9. ▼ **DOWN button** - When in MENU mode, scrolls DOWN through the menu and submenu selection options. When retrieving and viewing DTCs, scrolls down through the current display screen to display any additional data.

10. **GREEN LED** - Indicates that all engine systems are running normally (all Monitors on the vehicle are active and performing their diagnostic testing, and no DTCs are present). (Monitors are applicable to OBD2 systems only.)

11. **YELLOW LED** - Indicates there is a possible problem. A "Pending" or a history DTC is present and/or some of the vehicle's emission monitors have not run their diagnostic testing. (Monitors and pending DTCs are applicable to OBD2 systems only.)

12. **RED LED** - Indicates there is a problem in one or more of the vehicle's systems. The red LED is also used to show that DTC(s) are present. DTCs are shown on the Scan Tool's display. In this case, the Malfunction Indicator ("Check Engine") lamp on the vehicle's instrument panel will light steady on.

13. **Display** - Displays **Setup Menu** and submenus, test results, Scan Tool functions and Monitor status information. See DISPLAY FUNCTIONS, on next page, for more details. (Monitors are applicable to OBD2 systems only.)

14. **Cable** - Connects the Scan Tool to the vehicle's Data Link Connector (DLC) when retrieving codes from OBD I systems (used with items 12, 13, 14 and 16).

15. **CHRYSLER Connector Cable Adaptor** - Installs on cable (item 11) when connecting to a Chrysler OBD1 Data Link Connector.

16. **FORD Connector Cable Adaptor** - Installs on cable (item 11) when connecting to a Ford OBD1 Data Link Connector.

17. **GM Connector Cable Adaptor** - Installs on cable (item 11) when connecting to a GM OBD1 Data Link Connector.

18. **OBD II Cable** - Connects the Scan Tool to the vehicle's Data Link Connector (DLC) when retrieving codes from OBD II systems.

19. **TOYOTA Connector Cable Adaptor** - Installs on cable (item 11) when connecting to a Toyota OBD1 Data Link Connector.

DISPLAY FUNCTIONS

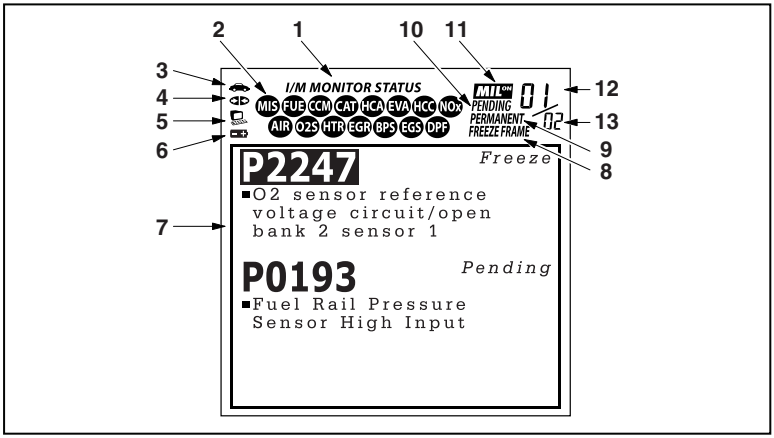


Figure 2. Display Functions

See Figure 2 for the locations of items 1 through 16, following.

1. **I/M MONITOR STATUS field** - Identifies the I/M Monitor status area. (This function is applicable to OBD2 systems only.)
2. **Monitor icons** - Indicate which Monitors are supported by the vehicle under test, and whether or not the associated Monitor has run its diagnostic testing (Monitor status). When a Monitor icon is solid, it indicates that the associated Monitor has completed its diagnostic testing. When a Monitor icon is flashing, it indicates that the vehicle supports the associated Monitor, but the Monitor has not yet run its diagnostic testing. (This function is applicable to OBD2 systems only.)
3. **Vehicle icon** - Indicates whether or not the Scan Tool is being properly powered through the vehicle's Data Link Connector (DLC). A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
4. **Link icon** - Indicates whether or not the Scan Tool is communicating (linked) with the vehicle's on-board computer. When visible, the Scan Tool is communicating with the computer. If the Link icon is not visible, the Scan Tool is not communicating with the computer.
5. **Computer icon** - When this icon is visible it indicates that the Scan Tool is linked to a personal computer. Optional "Shop Software" is available that makes it possible to upload retrieved data to a personal computer.
6. **Internal Battery icon** - When visible, indicates the Scan Tool batteries are "low" and should be replaced. If the batteries are not replaced when the battery symbol is "on", all 3 LEDs will light up as a last resort indicator to warn you that the batteries need replacement. No data will be displayed on screen when all 3 LEDs are lit.

7. **Display Area** - Displays the Diagnostic Trouble Code (DTC) numbers. DTC definitions, Freeze Frame data, and other pertinent test information messages.
8. **FREEZE FRAME icon** - Indicates that there is Freeze Frame data from "Priority Code" (Code #1) stored in the vehicle's computer memory.
9. **PERMANENT Icon** - Indicates the currently displayed DTC is a "Permanent" code.
10. **PENDING icon** - Indicates the currently displayed DTC is a "Pending" code.
11. **MIL icon** - Indicates the status of the Malfunction Indicator Lamp (MIL). The MIL icon is visible only when a DTC has commanded the MIL on the vehicle's dashboard to light.
12. **Code Number Sequence** - The Scan Tool assigns a sequence number to each DTC that is present in the computer's memory, starting with "01." This number indicates which code is currently displayed. Code number "01" is always the highest priority code, and the one for which "Freeze Frame" data has been stored. (Freeze Frame data is applicable to OBD2 systems only.)

If "01" is a "Pending" code, there may or may not be "Freeze Frame" data stored in memory.

13. **Code Enumerator** - Indicates the total number of codes retrieved from the vehicle's computer.

PRELIMINARY VEHICLE DIAGNOSTIC WORKSHEET

The purpose of this form is to help you gather preliminary information on a vehicle before you retrieve codes. By having a complete account of the vehicle's current problem(s), you will be able to systematically pinpoint the problem(s) by comparing your answers to the fault codes you retrieve.

NAME:

DATE:

VIN*:

YEAR:

MAKE:

MODEL:

ENGINE SIZE:

VEHICLE MILEAGE:

*VIN: Vehicle Identification Number, found at the base of the windshield on a metallic plate, or at the driver door latch area (consult your vehicle owner's manual for location).

TRANSMISSION:

- ❑ Automatic
- ❑ Manual

Please check all applicable items in each category.

DESCRIBE THE PROBLEM:

WHEN DID YOU FIRST NOTICE THE PROBLEM:

- ❑ Just Started
- ❑ Started Last Week
- ❑ Started Last Month
- ❑ Other: _____

LIST ANY REPAIRS DONE IN THE PAST SIX MONTHS:

PROBLEMS STARTING

- ❑ No symptoms
- ❑ Will not crank
- ❑ Cranks, but will not start
- ❑ Starts, but takes a long time

ENGINE QUITS OR STALLS

- ❑ No symptoms
- ❑ Right after starting
- ❑ When shifting into gear
- ❑ During steady-speed driving
- ❑ Right after vehicle comes to a stop
- ❑ While idling
- ❑ During acceleration
- ❑ When parking

IDLING CONDITIONS

- ❑ No symptoms
- ❑ Is too slow at all times
- ❑ Is too fast
- ❑ Is sometimes too fast or too slow
- ❑ Is rough or uneven
- ❑ Fluctuates up and down

RUNNING CONDITIONS

- ❑ No symptoms
- ❑ Runs rough
- ❑ Lacks power
- ❑ Bucks and jerks
- ❑ Poor fuel economy
- ❑ Hesitates or stumbles on accelerations
- ❑ Backfires
- ❑ Misfires or cuts out
- ❑ Engine knocks, pings or rattles
- ❑ Surges
- ❑ Dieseling or run-on

AUTOMATIC TRANSMISSION PROBLEMS (if applicable)

- ❑ No symptoms
- ❑ Shifts too early or too late
- ❑ Changes gear incorrectly
- ❑ Vehicle does not move when in gear
- ❑ Jerks or bucks

PROBLEM OCCURS

- ❑ Morning
- ❑ Afternoon
- ❑ Anytime

ENGINE TEMPERATURE WHEN PROBLEM OCCURS

- ❑ Cold
- ❑ Warm
- ❑ Hot

DRIVING CONDITIONS WHEN PROBLEM OCCURS

- ❑ Short - less than 2 miles
- ❑ 2 - 10 miles
- ❑ Long - more than 10 miles
- ❑ Stop and go
- ❑ While turning
- ❑ While braking
- ❑ At gear engagement
- ❑ With A/C operating
- ❑ With headlights on
- ❑ During acceleration
- ❑ Mostly driving downhill
- ❑ Mostly driving uphill
- ❑ Mostly driving level
- ❑ Mostly driving curvy roads
- ❑ Mostly driving rough roads

DRIVING HABITS

- ❑ Mostly city driving
- ❑ Highway
- ❑ Park vehicle inside
- ❑ Park vehicle outside
- ❑ Drive less than 10 miles per day
- ❑ Drive 10 to 50 miles per day
- ❑ Drive more than 50 miles per day

GASOLINE USED

- ❑ 87 Octane
- ❑ 89 Octane
- ❑ 91 Octane
- ❑ More than 91 Octane

WEATHER CONDITIONS WHEN PROBLEM OCCURS

- ❑ 32 - 55° F (0 - 13° C)
- ❑ Below freezing (32° F / 0° C)
- ❑ Above 55° F (13° C)

CHECK ENGINE LIGHT / DASH WARNING LIGHT

- ❑ Sometimes ON
- ❑ Always ON
- ❑ Never ON

PECULIAR SMELLS

- ❑ "Hot"
- ❑ Sulfur ("rotten egg")
- ❑ Burning rubber
- ❑ Gasoline
- ❑ Burning oil
- ❑ Electrical

STRANGE NOISES

- ❑ Rattle
- ❑ Knock
- ❑ Squeak
- ❑ Other

BEFORE YOU BEGIN

The Scan Tool aids in monitoring electronic- and emissions-related faults in your vehicle and retrieving fault codes related to malfunctions in these systems. Mechanical problems such as low oil level or damaged hoses, wiring or electrical connectors can cause poor engine performance and may also cause a fault code to set. Fix any known mechanical problems before performing any test. See your vehicle's service manual or a mechanic for more information.

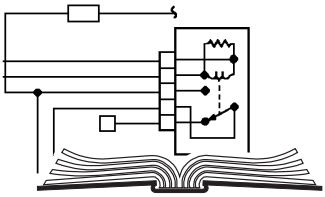
Check the following areas **before** starting any test:

- Check the engine oil, power steering fluid, transmission fluid (if applicable), engine coolant and other fluids for proper levels. Top off low fluid levels if needed.
- Make sure the air filter is clean and in good condition. Make sure all air filter ducts are properly connected. Check the air filter ducts for holes, rips or cracks.
- Make sure all engine belts are in good condition. Check for cracked, torn, brittle, loose or missing belts.
- Make sure mechanical linkages to engine sensors (throttle, gearshift position, transmission, etc.) are secure and properly connected. See your vehicle's service manual for locations.
- Check all rubber hoses (radiator) and steel hoses (vacuum/fuel) for leaks, cracks, blockage or other damage. Make sure all hoses are routed and connected properly.
- Make sure all spark plugs are clean and in good condition. Check for damaged, loose, disconnected or missing spark plug wires.
- Make sure the battery terminals are clean and tight. Check for corrosion or broken connections. Check for proper battery and charging system voltages.
- Check all electrical wiring and harnesses for proper connection. Make sure wire insulation is in good condition, and there are no bare wires.
- Make sure the engine is mechanically sound. If needed, perform a compression check, engine vacuum check, timing check (if applicable), etc.

VEHICLE SERVICE MANUALS

Always refer to the manufacturer's service manual for a vehicle before performing any test or repair procedures. Contact your local car dealership, auto parts store or bookstore for availability of these manuals. The following companies publish valuable repair manuals:

- **Haynes Publications**
  861 Lawrence Drive
  Newbury Park, California 91320
  Phone: 800-442-9637
  Web: www.haynes.com
- **Mitchell 1**
  14145 Danielson Street
  Poway, California 92064
  Phone: 888-724-6742
  Web: www.m1products.com
- **Motor Publications**
  5600 Crooks Road, Suite 200
  Troy, Michigan 48098
  Phone: 800-426-6867
  Web: www.motor.com



FACTORY SOURCES

Ford, GM, Chrysler, Honda, Isuzu, Hyundai and Subaru Service Manuals

- **Helm Inc.**
  14310 Hamilton Avenue
  Highland Park, Michigan 48203
  Phone: 800-782-4356
  Web: www.helminc.com

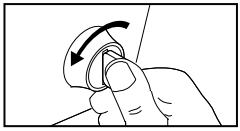
CODE RETRIEVAL PROCEDURE

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

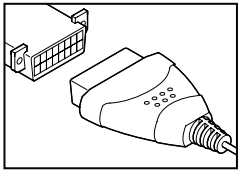
Check the vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 2 for connector location.



Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.

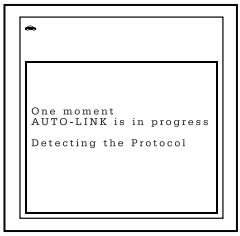


*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*

3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.
   - If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
   - If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, the "To Link" screen displays.

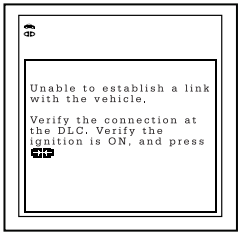
   - If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.
   - If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer (PCM) fuse/circuit, and perform any necessary repairs before proceeding.

6. Press the **POWER/LINK** button. The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.

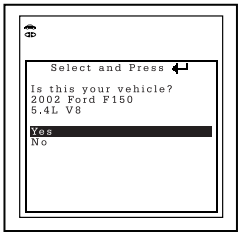


A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

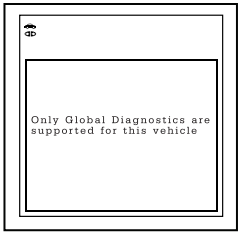


7. Once the vehicle's communication protocol has been determined, the Scan Tool performs a "VIN check" to identify the vehicle.

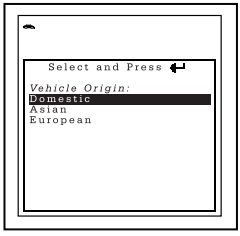


- If the Scan Tool is able to identify the vehicle, the Confirm Vehicle screen displays.
- If the correct vehicle is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.
  - If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 13 to select the type of data you wish to view.

- If enhanced diagnostics *are not supported* by the vehicle, an advisory message shows momentarily on the Scan Tools display. Proceed to step 15 to view global DTCs.

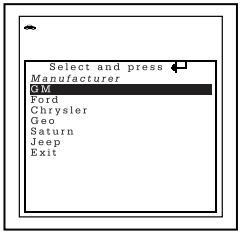


- If the correct vehicle *is not* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.
  - The Select Vehicle Origin screen displays.



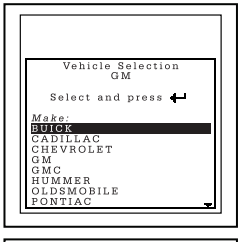
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired country of origin, then press the **ENTER** ↵ button.

- The Select Manufacturer screen displays



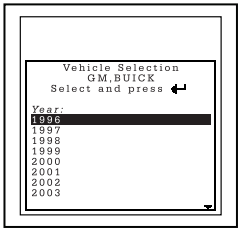
9. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle manufacturer, then press the **ENTER** ↵ button.

- If **Other** is chosen from the Select Vehicle Manufacturer screen, enhanced diagnostics *are not supported* for the vehicle. An advisory message shows momentarily on the Scan Tool's display. Proceed to step 15 to view global DTCs.
- If **Ford**, **General Motors**, **Chrysler** or **Toyota** is chosen from the Select Vehicle Manufacturer screen, the Select Make screen displays.



10. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

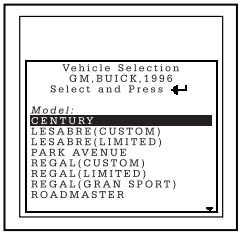
- The Select Model Year screen displays,



11. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

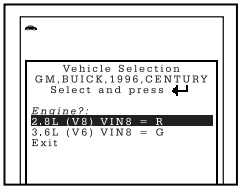
- The Select Model screen displays.

12. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.

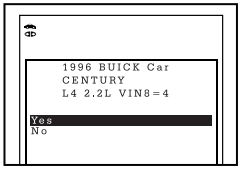


- The Engine Type screen displays.

13. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the correct engine type, then press the **ENTER** ↵ button to continue.

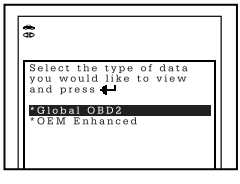


- The Confirm Vehicle screen displays.
- If the correct vehicle *is* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.
- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.
- If enhanced diagnostics *are not* supported by the vehicle, an advisory message shows momentarily on the Scan Tools display. Proceed to step 15 to view global DTCs.



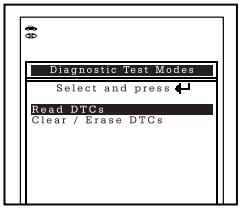
- If the correct vehicle is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Manufacturer screen and re-enter the appropriate vehicle information.

14. If the vehicle supports both Global and enhanced diagnostics, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Global OBD2**, then press the **ENTER** ↵ button.



You can return to the Select Data Type screen at any time to revise you selection (as long as the Scan Tool is connected to the vehicle) by pressing ***POWER/LINK*** ⏻ *button.*

- The Diagnostic Test Modes screen displays.



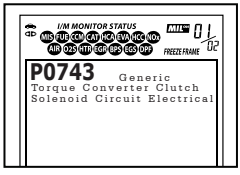
15. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, than press the **ENTER** ↵ button.

16. The Scan Tool will **retrieve** and **display** any global OBD2 Diagnostic Trouble Codes, Monitor Status and Freeze Frame data retrieved from the vehicle's computer memory.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, the message "No DTCs or Freeze Frame data presently stored in the vehicle's computer. For more information select any HotKey" displays.
- The Scan Tool is capable of retrieving and storing up to 32 codes in memory, for immediate or later viewing.

17. To read the display:

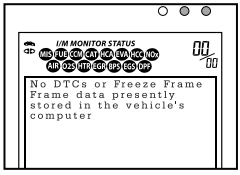
Refer to DISPLAY FUNCTIONS on page 13 for a description of display elements.



- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
- The I/M Monitor Status icons indicate the type and number of Monitors the vehicle supports, and provides indications of the current status of the vehicle's Monitors. A **solid** Monitor icon indicates the associated Monitor **has run** and completed its testing. A **blinking** Monitor icon indicates the associated Monitor **has not** run and completed its testing.
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved, and whether or not the displayed code commanded the MIL on. If the code being displayed is a PENDING code, the PENDING icon is shown. If the code being displayed is a PERMANENT code, the PERMANENT icon is shown.
- The Diagnostic Trouble Codes (DTCs) and related code definition are shown in the lower section of the display.

18. Read and interpret Diagnostic Trouble Codes/system condition using the display and the green, yellow and red LEDs.

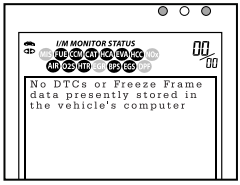
The green, yellow and red LEDs are used (with the display) as visual aids to make it easier to determine engine system conditions.



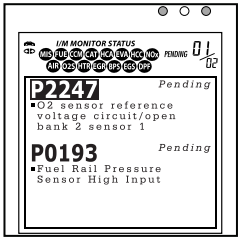
- **Green LED** – Indicates that all engine systems are "OK" and operating normally. All monitors supported by the vehicle have run and performed their diagnostic testing, and no trouble codes are present. All Monitor icons will be solid.

- **Yellow LED** – Indicates one of the following conditions:

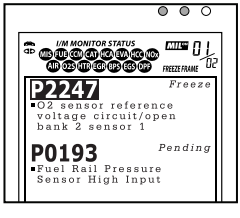
A. PENDING CODE IS PRESENT – If the yellow LED is illuminated, it may indicate a Pending code is present. Check the Scan Tool's display for confirmation. A Pending code is confirmed by the presence of a numeric code and the word PENDING on the Scan Tool's display.


I/M MONITOR STATUS
MIS FUL COM CAT HCA SVA HCO NOx
AIR O2S HTR EGR HRS CCS
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer

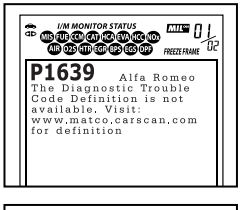
B. MONITOR NOT RUN STATUS – If the Scan Tool's display shows a zero (indicating there are no DTC's present in the vehicle's computer memory), but the yellow LED is illuminated, it may be an indication that some of the Monitors supported by the vehicle have not yet run and completed their diagnostic testing. Check the Scan Tool's display for confirmation. All Monitor icons that are **blinking** have not yet run and completed their diagnostic testing; all Monitor icons that are **solid** have run and completed their diagnostic testing.



- **Red LED** – Indicates there is a problem with one or more of the vehicle's systems. The red LED is also used to indicate that DTC(s) are present (displayed on the Scan Tool's screen). In this case, the Malfunction Indicator (Check Engine) lamp on the vehicle's instrument panel will be illuminated.

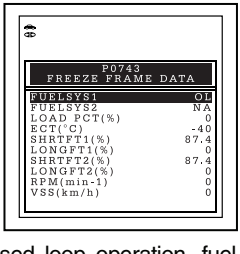


If the definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's LCD display.



19. If more than one DTC was retrieved, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.

- In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data (See VIEWING FREEZE FRAME DATA on page 26 for more information). Saved engine conditions include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure.



*If more than one malfunction is present that causes more than one DTC to be set, only the code with the highest priority will contain Freeze Frame data. The code designated "**01**" on the Scan Tool display is referred to as the PRIORITY code, and Freeze Frame data always refers to this code. The priority code is also the one that has commanded the MIL on.*

Retrieved information can be uploaded to a Personal Computer (PC) with the use of optional software (see instructions included with the software for more information).

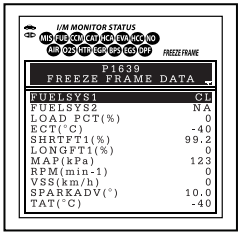
20. Determine engine system(s) condition by viewing the Scan Tool's display for any retrieved Diagnostic Trouble Codes, code definitions, Freeze Frame data and Live Data, interpreting the green, yellow and red LEDs.

- If DTC's were retrieved and you are going to perform the repairs yourself, proceed by consulting the Vehicle's Service Repair Manual for testing instructions, testing procedures, and flow charts related to retrieved code(s).
- If you plan to take the vehicle to a professional to have it serviced, complete the PRELIMINARY VEHICLE DIAGNOSTIC WORKSHEET on page 15 and take it together with the retrieved codes, freeze frame data and LED information to aid in the troubleshooting procedure.
- To prolong battery life, the Scan Tool automatically shuts "Off" approximately three minutes after it is disconnected from the vehicle. The DTCs retrieved, captured Live Data Information, Monitor Status and Freeze Frame data (if any) will remain in the Scan Tool's memory, and may be viewed at any time by turning the unit "On". If the Scan Tool's batteries are removed, or if the Scan Tool is re-linked to a vehicle to retrieve codes/data, any prior codes/data in its memory are automatically cleared.

You can return to the Select Data Type screen at any time to view DTCs for another controller (as long as the Scan Tool is connected to the vehicle) by pressing the POWER/LINK button.

VIEWING FREEZE FRAME DATA

In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data.



1. While linked to the vehicle, press and release the **FF** button.

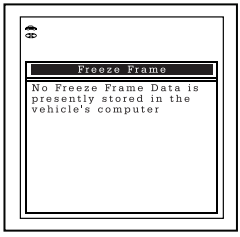
- The Freeze Frame screen displays.

- Saved engine conditions include but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate and intake manifold pressure.

*If more than one malfunction is present that causes more than one DTC to be set, only the code with the highest priority will contain Freeze Frame data. The code designated "**01**" on the Diagnostic Tool's display is referred to as the PRIORITY code, and Freeze Frame data always refers to this code. The priority code is also the one that has commanded the MIL on.*

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view all available Freeze Frame data.

2. When finished, press and release the **DTC** button to return to the Diagnostic Test Modes screen.



If no Freeze Frame data is present, the message "No Freeze Frame Data presently stored in the vehicle's computer" displays. Press the DTC button to return to the OBD2 DTC screen.

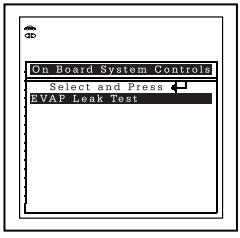
BI-DIRECTIONAL TEST

The **Bi-Directional Test** function lets you initiate a leak test for the vehicle's EVAP system.

*The Scan Tool does not perform the leak test, but signals to vehicle's on-board computer to initiate the test. The vehicle manufacturer determines the criteria and method for stopping the test once it has been started. BEFORE using the **Bi-Directional Test** function, refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.*

1. With the Scan Tool linked to the vehicle, press the **BI-DIRECTIONAL TEST** ⇌ button.

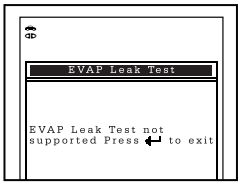
- The "On Board System Controls" menu displays.



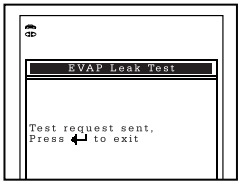
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **EVAP Leak Test**, then press the **ENTER** ↵ button.

3. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.

*Some vehicle manufacturers do not allow Scan Tools or other external devices to control vehicle systems. If the **EVAP Leak Test** is not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER** ↵ button to return to the System Test menu.*



4. When the EVAP leak test has been initiated by the vehicle's on-board computer, a confirmation message shows on the Scan Tool's display. Press the **ENTER** ↵ button to return to the "System Test Menu".

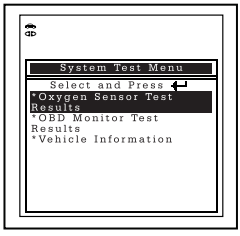


SYSTEM TESTS

In addition to retrieving Diagnostic Trouble Codes (DTCs) and viewing Live Data, you can use the Scan Tool to perform additional diagnostic tests and to view diagnostic and vehicle information stored in your vehicle's on-board computer.

Additional tests are accessed through the “System Test Menu.” The following functions are available from the "System Test Menu:"

- **O2 Sensor Test Results** - Retrieves and displays O2 sensor monitor test results from your vehicle's on-board computer.
- **OBD Monitor Test Results** - Retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored.
- **On-Board System Test** - Performs a leak test for the vehicle's EVAP system.



To access the “System Test Menu,” press and hold the **SYSTEM TEST** Ⓢ button until the “System Test Menu” displays.

The Scan Tool must be linked to the vehicle in order to access System Tests.

When finished, press and release the **DTC** button to return to the Diagnostic Test Modes screen.

Oxygen Sensor Test Results

OBD2 regulations require that applicable vehicles monitor and test operation of the oxygen (O2) sensors to identify problems that can affect fuel efficiency and vehicle emissions. These tests are performed automatically when engine operating conditions are within predefined limits. Results of these tests are stored in the on-board computer's memory.

The **Oxygen Sensor Test Results** function lets you retrieve and view O2 sensor monitor test results for the most recently completed tests from your vehicle's on-board computer.

Vehicles are equipped with multiple O2 sensors. O2 sensors are installed both upstream of (before) and downstream of (after) the exhaust system Catalytic Converters. The name of an O2 sensor identifies its location in the exhaust system. The name of each O2 sensor is made up of three parts:

O2S XX YY -or- **O2S X Y**

- **O2S** - this is the basic designation for all O2 sensors.
- **X** or **XX** - These characters identify the location of the O2 sensor in relation to a cylinder bank. An O2 sensor for cylinder bank 1 is identified by the designation “1” or "B1"; a sensor for cylinder bank 2 is identified as “2” or "B2."

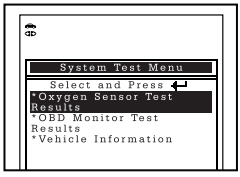
”Bank One” indicates the side of the engine where cylinder number one is located (V-type engines). Bank Two is opposite of Bank One.

- **Y** or **YY** - These characters identity the location of the O2 sensor in relation to the exhaust system catalyst. An O2 sensor located upstream of the catalyst is identified by the designation”1” or "S1", a sensor located downstream of the Catalytic Converter is identified as “2” or "S2."

For example, **O2S12** or **O2SB1S2** is the designation for the downstream O2 sensor for cylinder bank 1.

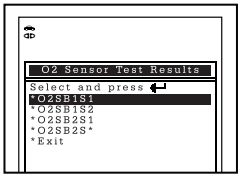
The Scan Tool does not perform O2 sensor tests, but retrieves results from the most recently performed O2 sensor tests from the on-board computer's memory. You may retrieve O2 sensor test results for only one test of one sensor at any given time.

1. From the "System Test Menu", use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Oxygen Sensor Test Results,** then press the **ENTER** ↵ button.

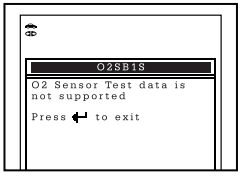


2. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.

- The Select Sensor screen displays. The screen shows all O2 sensors applicable to the vehicle under test.

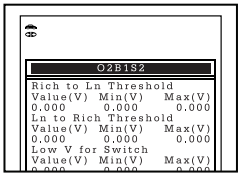


*If O2 sensor tests are not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER** ↵ button to return to the “System Test Menu.”*



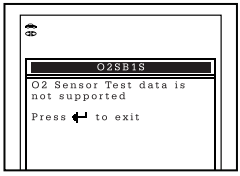
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the O2 sensor for which you wish to view test results, then press the **ENTER** ↵ button.

4. When test results have been retrieved, data for the selected sensor test will show on the Scan Tool's display.



*If test data for the selected sensor is not available, an advisory message shows on the Scan Tool's display. Press the **ENTER** ↵ button to return to the Select Sensor screen.*

5. When you have finished viewing the received test data, scroll to the end of the display to select **Exit**, then press the **ENTER** ↵ button to return to the Select Sensor screen.



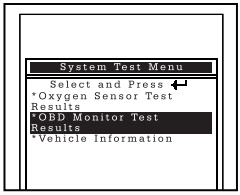
6. Repeat steps **3** through **5** to view test results for additional sensors. When you have finished viewing the retrieved test data, scroll to the end of the display to select **Exit**, then press the **ENTER** ↵ button to return to the System Test Menu screen.

OBD Monitor Test Results

The **OBD Monitor Test Results** function retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored. The tests available are determined by the vehicle manufacturer.

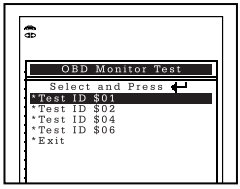
The Code Reader does not perform non-continuous tests, but retrieves results from the most recently performed tests from the on-board computer's memory. You may retrieve non-continuous test results for only one test at any given time.

1. From the "System Test Menu", use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OBD Monitor Test Results**, then press the **ENTER** ↵ button.

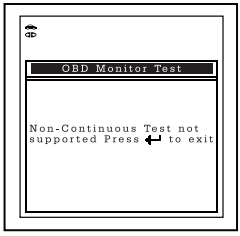


2. A "One moment please. . ." message displays while the request is sent to the vehicle's on-board computer.

   - The Select Test screen displays. The screen shows all tests applicable to the vehicle under test. Refer to the vehicle's service repair manual for information related to non-continuous tests.

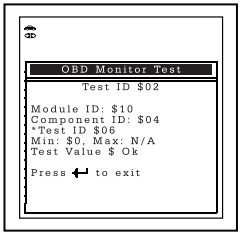


*If OBD monitor tests are not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER** ↵ button to return to the Mode Selection menu.*



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired test, then press the **ENTER** ↵ button.

4. When test results have been retrieved, data for the selected test will show on the Scan Tool's display. The display shows the following information:



   - **Test ID** number
   - **Module ID** number
   - **Component ID** number
   - **Min** or **Max** test limit

   *Only one test limit, either **Min** or **Max**, is shown for any given test.*

   - **Test Value** and status

   *Status is calculated by the Scan Tool by comparing the **Test Value** against the displayed test limit (either **Min** or **Max**). Status is shown as either **Low**, **High** or **OK**.*

5. Press the **ENTER** ↵ button to return to the Select Test screen.

6. Repeat steps **3** through **5** to view test results for additional tests. When you have finished viewing the retrieved test data, scroll to the end of the display to select **Exit**, then press the **ENTER** ↵ button to return to the Special Test Menu screen.

Viewing Vehicle Information

The **Vehicle Info** function offers three options for retrieving reference information for the vehicle under test; **Vehicle ID**, **Available Modules** and **IPT** (In-Use Performance Tracking).

Retrieving Vehicle ID Information

The Vehicle ID function is applicable to model year 2000 and newer OBD2-compliant vehicles.

The Scan Tool can retrieve a list of information (provided by the vehicle manufacturer), unique to the vehicle under test, from the vehicle's on-board computer. This information may include:

- The vehicle's VIN number
- The control module identification number

- The vehicle's calibration ID(s). These IDs uniquely identify the software version(s) for the vehicle's control module(s).
- The Vehicle's Calibration Verification Number(s) (CVNs) required by ODB2 regulations. CVNs are used to determine if emission-related calibrations for the vehicle under test have been changed. One or more CVNs may be returned by the vehicle's computer.

1. From the "System Test Menu", use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.

2. A “One moment please…” message displays while the request is sent to the vehicle’s on-board computer.

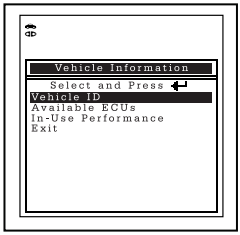
- The Vehicle Information Menu displays.

*If the Vehicle Information function is not supported by the vehicle under test, an advisory message shows on the Scan Tool’s display. Press the **ENTER** ↵ button to return to the "System Test Menu".*

3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle ID**, then press the **ENTER** ↵ button.

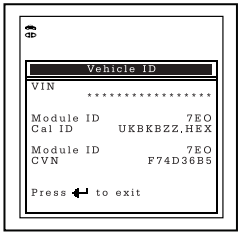
4. A "One moment please..." message displays while the requested information is retrieved from the vehicle's computer.

*The first time the **Vehicle ID** function is used, it may take <u>several minutes</u> to retrieve the information from the vehicle's computer.*



5. When the retrieval process is completed, the vehicle ID information is shown on the Scan Tool's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.

6. When you have finished viewing the retrieved vehicle ID information, press the **ENTER** ↵ button to exit.



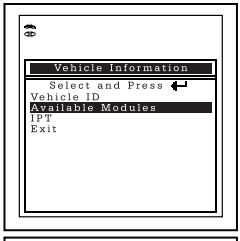
Viewing Available Modules

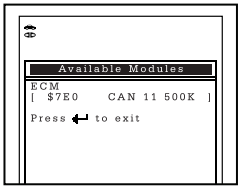
The Scan Tool can retrieve a list of modules supported by the vehicle under test.

1. From the "System Test Menu", use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.
2. A “One moment please…” message displays while the request is sent to the vehicle’s on-board computer.
   - The Vehicle Information Menu displays.

*If the Vehicle Information function is not supported by the vehicle under test, an advisory message shows on the Scan Tool’s display. Press the **ENTER** ↵ button to return to the "System Test Menu".*

3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Available Modules**, then press the **ENTER** ↵ button.
4. A "One moment please..." message displays while the requested information is retrieved from the vehicle's computer.
5. When the retrieval process is completed, a complete list of modules supported by the vehicle under test is shown on the Scan Tool's display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
6. When you have finished viewing the list of available modules, press the **ENTER** ↵ button to return to exit.

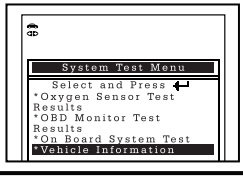




Viewing In-use Performance Tracking (IPT)

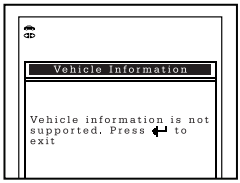
The Scam Tool can retrieve In-use Performance Tracking (IPT) statistics for monitors supported by the vehicle under test. Two values are returned for each monitor; the number of times that all conditions necessary for a specific monitor to detect a malfunction have been encountered (XXXCOND), and the number of times that the vehicle has been operated under the specific conditions for the monitor (XXXCOMP). Statistics are also provided for the number of times the vehicle has been operated in OBD monitoring conditions (OBDCOND), and the number of times the vehicle’s engine has been started (IGNCNTR).

1. From the "System Test Menu", use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Vehicle Information**, then press the **ENTER** ↵ button.

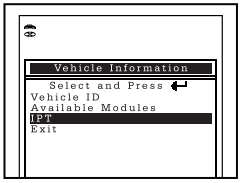


2. A “One moment please…” message displays while the request is sent to the vehicle’s on-board computer.
   - The Vehicle Information Menu displays.

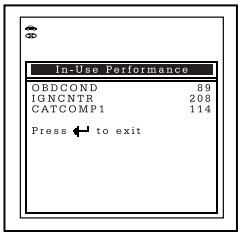
*If the Vehicle Information function is not supported by the vehicle under test, an advisory message shows on the Scan Tool’s display. Press the **ENTER** ↵ button to return to the "System Test Menu".*



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **IPT**, then press the **ENTER** ↵ button.
4. A “One moment please . . .” message displays while the requested information is retrieved from the vehicle’s computer.



5. When the retrieved process is completed, In-use Performance Tracking statistics for monitors supported by the vehicle under test are shown on the Scan Tool’s display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
6. When you have finished viewing the statistics, press the **ENTER** ↵ button to exit.



ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

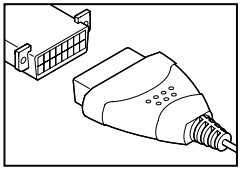
When the Scan Tool’s ERASE function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data and manufacturer-specific enhanced data are also erased.

Erase DTCs from the computer's memory as follows:

When DTCs are erased from the vehicle's computer memory, the I/M Readiness Monitor Status program resets the status of all Monitors to a not run "flashing" condition. To set all of the Monitors to a DONE status, an OBD2 Drive Cycle must be performed. Refer to your vehicle's service manual for information on how to perform an OBD2 Drive Cycle for the vehicle under test.

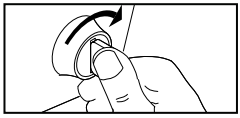
The Scan Tool must be connected to the vehicle’s DLC to erase the codes from the computer’s memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)



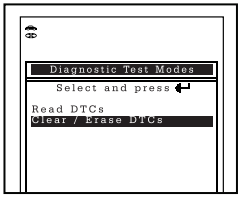
2. Perform the see CODE RETRIEVAL PROCEDURE on page 20 and select **Global OBD** from the Select Data Type menu.

- The Diagnostic Test Modes menu displays.



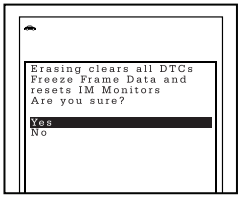
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.

4. If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase DTCs from the vehicle's computer.

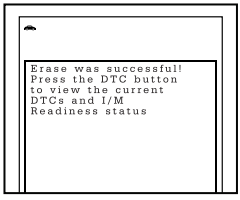


5. If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.

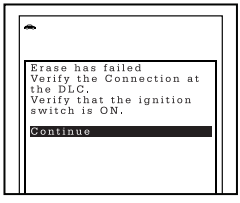
6. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.



- If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTC screen.



- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on. Press the **ENTER** ↵ button and repeat steps **2** and **3**, above.



Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

I/M READINESS TESTING

I/M is an Inspection and Maintenance program legislated by the Government to meet federal clean-air standards.

The program requires that a vehicle be taken periodically to an Emissions Station for an "Emissions Test" or "Smog Check," where the emissions-related components and systems are inspected and tested for proper operation. Emissions Tests are generally performed once a year, or once every two years.

On OBD2 systems, the I/M program is enhanced by requiring vehicles to meet stricter test standards. One of the tests instituted by the Federal Government is called I/M 240. On I/M 240, the vehicle under test is driven under different speeds and load conditions on a dynamometer for 240 seconds, while the vehicle's emissions are measured.

Emissions tests vary depending on the geographic or regional area in which the vehicle is registered. If the vehicle is registered in a highly urbanized area, the I/M 240 is probably the type of test required. If the vehicle is registered in a rural area, the stricter "dynamometer type" test may not be required.

I/M Readiness Monitors

I/M Readiness shows whether the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

State and Federal Governments enacted Regulations, Procedures and Emission Standards to ensure that all emissions-related components and systems are **continuously** or **periodically** monitored, tested and diagnosed whenever the vehicle is in operation. It also requires vehicle manufacturers to automatically detect and report any problems or faults that may increase the vehicle's emissions to an unacceptable level.

The vehicle's emissions control system consists of several components or sub-systems (Oxygen Sensor, Catalytic Converter, EGR, Fuel System, etc.) that aid in reducing vehicle emissions.

To have an efficient Vehicle Emission Control System, all the emissions-related components and systems must work correctly whenever the vehicle is in operation.

To comply with State and Federal Government regulations, vehicle manufacturers designed a series of special computer programs called "Monitors" that are programmed into the vehicle's computer. Each of these Monitors is specifically designed to run tests and diagnostics on a specific emissions-related component or system (Oxygen Sensor, Catalytic Converter, EGR Valve, Fuel System, etc.) to ensure their proper operation. Currently, there are a maximum of eleven Monitors available for use.

Each Monitor has a specific function to test and diagnose only its designated emissions-related component or system. The names of the Monitors (Oxygen Sensor Monitor, Catalyst Monitor, EGR Monitor, Misfire Monitor, etc.) describe which component or system each Monitor is designed to test and diagnose.

Emissions Inspection and Maintenance (I/M) Readiness

Monitor Status Information

I/M Readiness Monitor Status shows which of the vehicle's Monitors have run and completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

- If a Monitor was able to meet all the conditions required to enable it to perform the self-diagnosis and testing of its assigned engine system, it means the monitor "HAS RUN."
- If a Monitor has not yet met all the conditions required for it to perform the self-diagnosis and testing of its assigned engine system; it means the Monitor "HAS NOT RUN."

The Monitor Run/Not Run status does not show whether or not a problem exists in a system. Monitor status only indicates whether a particular Monitor has or has not run and performed the self-diagnosis and testing of its associated system.

Performing I/M Readiness Quick Check

When a vehicle first comes from the factory, all Monitors indicate a "HAVE RUN" status. This indicates that all Monitors have run and completed their diagnostic testing. The "HAVE RUN" status remains in the computer's memory, unless the Diagnostic Trouble Codes are erased or the vehicle's computer memory is cleared.

The Scan Tool allows you to retrieve Monitor/System Status Information to help you determine if the vehicle is ready for an Emissions Test (Smog Check). In addition to retrieving Diagnostic Trouble Codes, the Scan Tool also retrieves Monitor Run/Not Run status. This information is very important since different areas of the state/country have different emissions laws and regulations concerning Monitor Run/Not Run status.

Before an Emissions Test (Smog Check) can be performed, your vehicle must meet certain rules, requirements and procedures legislated by the Federal and state (country) governments where you live.

1. In most areas, one of the requirements that must be met before a vehicle is allowed to be Emissions Tested (Smog Checked) is that the vehicle does not have any Diagnostic Trouble Codes present (with the exception of PENDING Diagnostic Trouble Codes).
2. In addition to the requirement that no Diagnostic Trouble Codes be present, some areas also require that all the Monitors that a particular vehicle supports indicate a "Has Run" status condition before an Emissions Check may be performed.
3. Other areas may only require that some (but not all) Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) may be performed.

Monitors with a "Has Run" status indicate that all the required conditions they needed to perform diagnosis and testing of their assigned engine area (system) have been met, and all diagnostic testing has completed successfully.

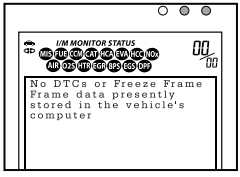
Monitors with a "Has Not Run" status have not yet met the conditions they need to perform diagnosis and testing of their assigned engine area (system), and have not been able to perform diagnostic testing on that system.

The green, yellow and red LEDs provide a quick way to help you determine if a vehicle is ready for an Emissions Test (Smog Check). Follow the instructions below to perform the Quick Check.

Perform the CODE RETRIEVAL PROCEDURE as described on page 20, then interpret the LED indications as follows:

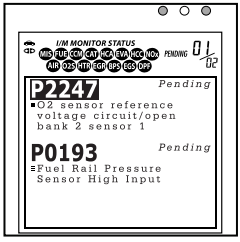
Interpreting I/M Readiness Test Results

1. **GREEN LED** - Indicates that all engine systems are "OK" and operating normally (all Monitors supported by the vehicle have run and performed their self-diagnostic testing). The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility that it can be certified.

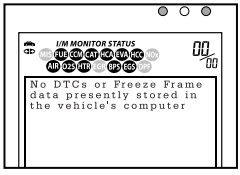

I/M MONITOR STATUS
MIS FUL CAT HO2 EGR HCA
AIR 02S HTR CMP SBS OBD
00
00
No DTCs or Freeze Frame Frame data presently stored in the vehicle's computer

2. **YELLOW LED** - Determine from the CODE RETRIEVAL PROCEDURE (page 20) which of the two possible conditions is causing the yellow LED to light.

   - If a "PENDING" Diagnostic Trouble Code is causing the yellow LED to light, it is possible that the vehicle will be allowed to be tested for emissions and certified. Currently, most areas (states / countries) will allow an Emissions Test (Smog Check) to be performed if the only code in the vehicle's computer is a "PENDING" Diagnostic Trouble Code.



   - If the illumination of the Yellow LED is being caused by monitors that “have not run” their diagnostic testing, then the issue of the vehicle being ready for an Emissions Test (Smog Check) depends on the emissions regulations and laws of your local area.

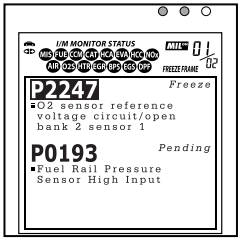

I/M MONITOR STATUS
MIS FUL CAT HO2 EGR HCA
AIR 02S HTR CMP SBS OBD
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer

     - Some areas require that all Monitors indicate a "Has Run" status before they allow an Emissions Test (Smog Check) to be performed. Other areas only require that some, but not all, Monitors have run their self-diagnostic testing before an Emissions Test (Smog Check) may be performed.

     - From the code retrieval procedure, determine the status of each Monitor (a solid Monitor icon shows Monitor "Has Run"

status, a flashing Monitor icon indicates "Has Not Run" status). Take this information to an emissions professional to determine (based on your test results) if your vehicle is ready for an Emissions Test (Smog Check).

3. **RED LED** - Indicates there is a problem with one or more of the vehicle's systems. A vehicle displaying a red LED is definitely not ready for an Emissions Test (Smog Check). The red LED is also an indication that there are Diagnostic Trouble Code(s) present (displayed on the Scan Tool's screen). The Malfunction Indicator (Check Engine) Lamp on the vehicle's instrument panel will light steady. The problem that is causing the red LED to light must be repaired before an Emissions Test (Smog Check) can be performed. It is also suggested that the vehicle be inspected/repaired before driving the vehicle further.



If the Red LED was obtained, there is a definite problem present in the system(s). In these cases, you have the following options.

- Repair the vehicle yourself. If you are going to perform the repairs yourself, proceed by reading the vehicle service manual and following all its procedures and recommendations.
- Take the vehicle to a professional to have it serviced. The problem(s) causing the red LED to light must be repaired before the vehicle is ready for an Emissions Test (Smog Check).

Using the I/M Readiness Monitor Status to Confirm a Repair

The I/M Readiness Monitor Status function can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status. Use the following procedure to determine I/M Readiness Monitor Status:

1. Using retrieved Diagnostic Trouble Codes (DTCs) and code definitions as a guide, and following manufacturer's repair procedures, repair the fault or faults as instructed.
2. After the fault or faults have been repaired, connect the Scan Tool to the vehicle's DLC and erase the code or codes from the vehicle's computer memory.
   - See page 34 for procedures for ERASING DIAGNOSTIC TROUBLE CODES (DTCs) from the vehicle's on-board computer.
   - Write the codes down on a piece of paper for reference before erasing.
3. After the erase procedure is performed, most of the Monitor icons on the Scan Tool's display will be flashing. Leave the Scan Tool connected to the vehicle, and perform a Trip Drive Cycle for each "flashing" Monitor:

Misfire, Fuel and Comprehensive Component Monitors run continuously and their icons will always be on solid, even after the erase function is performed.

- Each DTC is associated with a specific Monitor. Consult the vehicle's service manual to identify the Monitor (or Monitors) associated with the faults that were repaired. Follow the manufacturer's procedures to perform a Trip Drive Cycle for the appropriate Monitors.
- While observing the Monitor icons on the Scan Tool's display, perform a Trip Drive Cycle for the appropriate Monitor or Monitors.

If the vehicle needs to be driven in order to perform a Trip Drive Cycle, ALWAYS have a second person help you. One person should drive the vehicle while the other person observes the Monitor icons on the Scan Tool for Monitor RUN status. Trying to drive and observe the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.

4. When a Monitor's Trip Drive Cycle is performed properly, the Monitor icon on the Scan Tool's display changes from "flashing" to "solid," indicating that the Monitor has run and finished its diagnostic testing.

- If, after the Monitor has run, the MIL on the vehicle's dash is not lit, and no stored or pending codes associated with that particular Monitor are present in the vehicle's computer, the repair was successful.
- If, after the Monitor has run, the MIL on the vehicle's dash lights and/or a DTC associated with that Monitor is present in the vehicle's computer, the repair was unsuccessful. Refer to the vehicle's service manual and recheck repair procedures.

The OBD2 Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

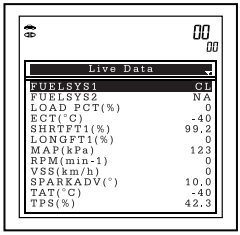
The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

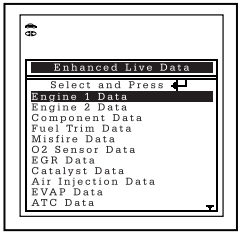
Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

VIEWING LIVE DATA

1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Live Data screen displays.





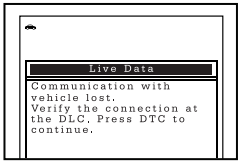
*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

2. Real-time Live Data (PID) information supported by the vehicle under test displays.

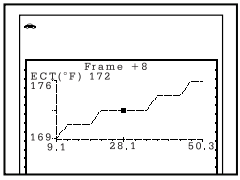
Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

3. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.

   - If communication with the vehicle is lost while viewing Live Data, a Communication Lost" message shows on the Scan Tool's display.

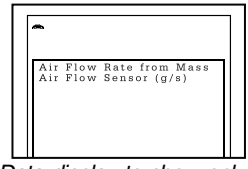


4. Press and release the **ENTER** ↵ button to view the currently selected PID in “graph” mode. Press and release the **ENTER** ↵ button again to return to the PID list.



5. Press and hold the **ENTER** ↵ button to view the “expanded” definition for the currently selected PID. Press and release the **ENTER** ↵ button again to return to the PID list.

6. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Scan Tool to specifications in the vehicle's repair manual.



*If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See **Customizing Live Data (PIDs)** below for details. You may also choose to "capture" (record) Live Data for later viewing. See RECORDING (CAPTURING) LIVE DATA on page 43 for details.*

CUSTOMIZING LIVE DATA (PIDs)

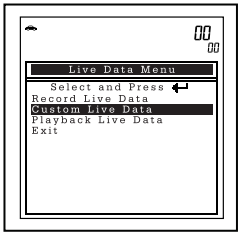
This feature lets you customize the Scan Tool display to show only those PIDs that are of interest at the current time. You can customize the Live Data display by placing the Scan Tool in "Custom Live Data" mode and selecting only the PIDs that you wish to display. To customize the Live Data display, proceed as follows:

1. While linked to the vehicle, start the engine, then press and release the **LD** button.

   - The Live Data screen displays.

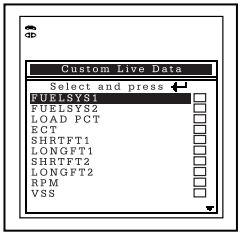
*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

2. Press and hold the **LD** button.
   - The Live Data menu displays.



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Custom Live Data**, then press the **ENTER** ↵ button.
   - The Custom Live Data menu displays, with the first PID in the menu highlighted.

4. Use the **UP** ▲ and **DOWN** ▼ buttons to scroll through the available PIDs. When the PID you wish to display is highlighted, press the **ENTER** ↵ button to select it (a "checkmark" will show in the checkbox to the right of the PID to confirm your selection). Repeat the procedure until only the PIDs you want to display have all been selected.



   - To deselect a currently selected PID, highlight the PID, then press the **ENTER** ↵ button. The checkmark will be removed from the checkbox.

5. When you are finished making your selection(s), scroll to the end of the PID list and highlight the word **DONE**, then press the **ENTER** ↵ button.
   - The Scan Tool is now in "Custom Live Data" mode. Only the PIDs you selected are shown on the Scan Tools display. Pressing the **LD** button repeatedly will toggle between the "full" and "custom" Live Data displays.

6. To exit the "Custom Live Data" mode, press and hold the **LD** button until the Live Data screen appears.

RECORDING (CAPTURING) LIVE DATA

You can record and save several frames of Live Data information for each PID supported by the vehicle in the Scan Tool's memory. Recorded Live Data can serve as valuable information to help you in the troubleshooting of vehicle problems.

There are two ways that the Scan Tool can "record" Live Data:

- Record by DTC Trigger
- Record by Manual Trigger

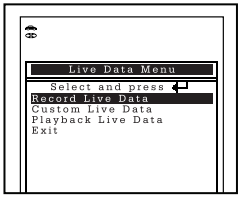
Record by DTC Trigger

This function automatically records (captures) Live Data information when a DTC sets and saves it in the Scan Tool's memory. The recorded (captured) data can be a valuable troubleshooting aid, particularly if you are experiencing a fault that is causing a DTC to set.

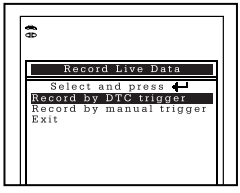
1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Live Data screen displays.

*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

2. Press and hold the **LD** button.
   - The Live Data menu displays.



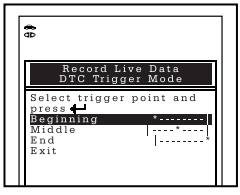
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Record Live Data**, then press the **ENTER** ↵ button.
   - The Record Live Data Menu displays.



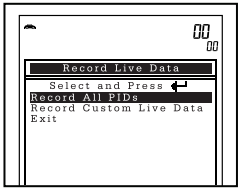
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Record by DTC trigger**, then press the **ENTER** ↵ button.
5. When the "Record by DTC Trigger" screen displays, select the desired trigger point as follows:

The Scan Tool is capable of recording approximately 100 frames of Live Data. Record by DTC trigger lets you select the point in time at which you wish the Scan Tool to begin recording Live Data. You can set the trigger point to record the 100 frames of data before an event (when the DTC sets), after the event, or in the middle (50 frames before and 50 frames after the event.

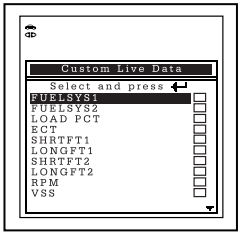
- **Beginning** - records approximately 100 frames of Live Data after the DTC sets.
- **Middle** - records approximately 50 frames of Live Data before and 50 frames after the DTC sets.
- **End** - records approximately 100 frames of Live Data before the DTC sets.



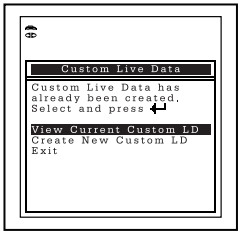
6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired trigger point, then press the **ENTER** ↵ button.
   - The Select PIDs to Record screen displays.



7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the type of PIDs you wish to record, then press the **ENTER** ↵ button.



- If **Record Custom Live Data** is selected, and you have not set up "custom" Live Data, the Custom Live Data menu displays. Select the desired PIDs as described in CUSTOMIZING LIVE DATA (PIDs) on page 42, then proceed to step 8.
- If **Record Custom Live Data** is selected, and you have set up "custom" live data, a confirmation screen displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button.

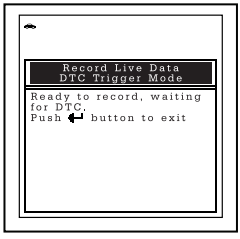


  - If **View Current Custom LD** is selected, proceed to step 8.
  - If **Create New Custom LD** is selected, the Custom Live Data menu displays. Select the desired PIDs as described in CUSTOMIZING LIVE DATA (PIDs) on page 42, then proceed to step 8.

8. A "One moment please. . ." message shows on the display. When the Scan Tool is ready to record Live Data, the "Record Live Data" screen displays.

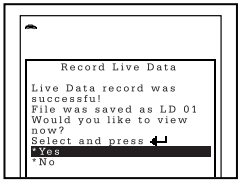
9. Put the engine in the operating condition that causes the DTC to set.

- If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.



10. When the Scan Tool detects a fault that causes a DTC to set, it automatically records and saves approximately 20 frames of Live Data information in its memory (according to your trigger selection) for each PID supported by the vehicle.

- All three LEDs will blink for three seconds to indicate that Live Data is being recorded, and a "One moment please..." message shows on the display, along with the number of the frame being recorded.
- When recording is complete, a confirmation screen displays, asking if you would like to view the recorded data. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select **Yes** or **No**, as desired, then press the **ENTER** ↵ button.



*If **Yes** is selected, the Scan Tool enters "Playback" mode from which you can view a frame-by-frame playback of recorded Live Data (see LIVE DATA PLAYBACK on page 49 for details). If **No** is selected, the display returns to the "Mode Selection Menu".*

11. You can exit the "Record Live Data Mode" at any time by pressing and holding the **LD** button.

If desired, you can transfer the recorded Live Data information to a personal computer with the use of optional software (see instructions included with the software for more information).

Record by Manual Trigger

This option lets you select the precise time at which the Live Data recording will occur. Record by Manual Trigger can be a very valuable diagnostic tool when troubleshooting intermittent problems that do not meet the requirements for a DTC to set. Even though a DTC is not present, the intermittent problems will sometimes manifest themselves briefly, for a few fractions of a second and/or only at certain vehicle speeds or vehicle operating conditions.

1. While linked to the vehicle, start the engine, then press and release the **LD** button.

- The Live Data screen displays.

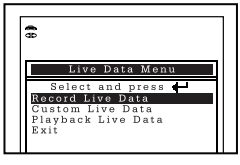
*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

2. Press and hold the **LD** button.

- The Live Data menu displays.

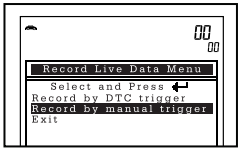
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Record Live Data**, then press the **ENTER** ↵ button.

- The Record Live Data Menu displays.



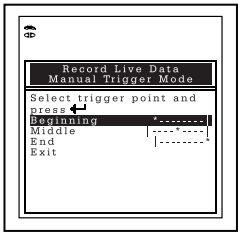
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Record by manual trigger**, then press the **ENTER** ↵ button.

5. When the "Record by Manual Trigger" screen displays, select the desired trigger point as follows:

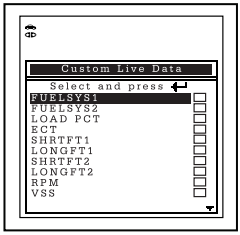


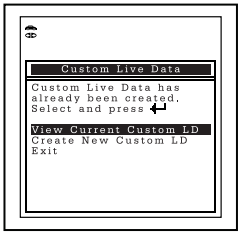
The Scan Tool is capable of recording approximately 100 frames of Live Data. Record by DTC trigger lets you select the point in time at which you wish the Scan Tool to begin recording Live Data. You can set the trigger point to record the 100 frames of data before an event (when the DTC was set), after the event, or in the middle (50 frames before and 50 frames after the event.

- **Beginning** - records approximately 100 frames of Live Data after the **ENTER** ↵ button was pressed.
- **Middle** - records approximately 50 frames of Live Data before and 50 frames after the **ENTER** ↵ button was pressed.
- **End** - records approximately 100 frames of Live Data before the **ENTER** ↵ button was pressed.

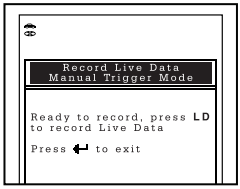


6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired trigger point, then press the **ENTER** ↵ button.
   - The Select PIDs to Record screen displays.
7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the type of PIDs you wish to record, then press the **ENTER** ↵ button.
   - If **Record Custom Live Data** is selected, and you have not set up "custom" Live Data, the Custom Live Data menu displays. Select the desired PIDs as described in CUSTOMIZING LIVE DATA (PIDs) on page 42, then proceed to step 8.
   - If **Record Custom Live Data** is selected, and you have set up "custom" live data, a confirmation screen displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button.
     - If **View Current Custom LD** is selected, proceed to step 8.
     - If **Create New Custom LD** is selected, the Custom Live Data menu displays. Select the desired PIDs as described in CUSTOMIZING LIVE DATA (PIDs) on page 42, then proceed to step 8.





8. A "One moment please. . ." message shows on the display. When the Scan Tool is ready to record Live Data, the "Record Live Data" screen displays.

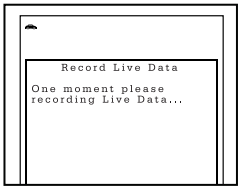


9. Put the engine in the operating condition where the problem manifests itself.

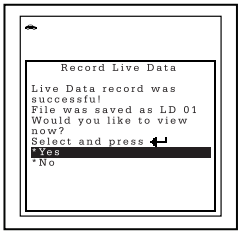
- If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.

10. When the problem occurs, press and release the **ENTER** ↵ button.

- All three LEDs will blink for three seconds to indicate that Live Data is being recorded, and a "One moment please. . ." message shows on the display, along with the number of the frame being recorded.



- When recording is complete, a confirmation screen displays, asking if you would like to view the recorded data. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select **Yes** or **No**, as desired, then press the **ENTER** ↵ button.



*If **Yes** is selected, the Scan Tool enters "Playback" mode from which you can view a frame-by-frame playback of recorded Live Data (see LIVE DATA PLAYBACK on page 49 for details). If **No** is selected, the display returns to the "Mode Selection Menu".*

11. You can exit the "Record Live Data Mode" at any time by pressing and holding the **LD** button.

If desired, you can transfer the recorded Live Data information to a personal computer with the use of optional software (see instructions included with the software for more information).

Important Information

1. When Live Data capture is initiated, the green, yellow and red LEDs on the Scan Tool will flash three times to indicate that Live Data is being saved to the Scan Tool's memory.

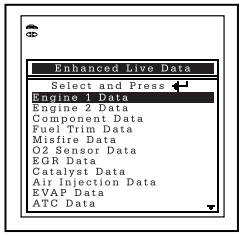
2. When you are LINKED to a vehicle and you are in the “Live Data View mode”, you can toggle between “Live Data View” mode and “DTC view” mode by alternately pressing and releasing the **DTC** or the **LD** buttons. The Scan Tool will stay linked to the vehicle’s computer during this process. However, if the **DTC** button is pressed twice the DTC screen will be advanced to the next DTC screen and the Scan Tool will be taken out of link.

LIVE DATA PLAYBACK

Once Live Data has been recorded, it is saved in the Scan Tool's memory. You can view recorded Live Data immediately after recording by selecting **Yes** from the Record Live Data confirmation screen (see RECORDING (CAPTURING) LIVE DATA on page 43 for more information), or you can view it later using the "Playback" function.

You can also view Live Data that has been saved to the Scan Tool's memory (see VIEWING DATA IN MEMORY on page 161).

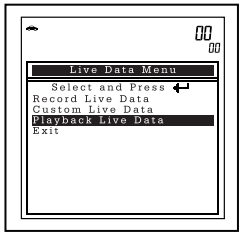
1. While linked to the vehicle, press and release the **LD** button.



- The Live Data screen displays.

*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

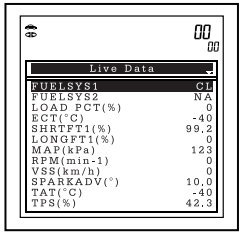
2. Press and hold the **LD** button.



- The Select Vehicle screen displays. The screen shows a lost of vehicles for which Live Data files have been saved, along with the number of files saved for each vehicle.
- The “Live Data” menu displays.

3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Playback Live Data**, then press the **ENTER** ↵ button.

4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired vehicle, then press the **ENTER** ↵ button.



- If *more than one* file is available for the selected vehicle, the Select File screen displays.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired file, then press the **ENTER** ↵ button.

5. The display shows the recorded Live Data, beginning with the “trigger” frame.

*When you select **Yes** from the Record Live Data confirmation screen, the Scan Tool enters the "Live Data Playback" mode, and the display shows the recorded Live Data, beginning with the "trigger" frame.*

- A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.
- When viewing recorded Live Data, look for any irregularities in any of the PID values/signal information (LTFT %, RPM, MAP, TEMP, etc.). If any PIDs are not within specification, or irregularities are detected, follow the procedures in the vehicle's service repair manual to perform additional troubleshooting and repair.

When recorded Live Data is played back, all available PIDs are shown, even if you have customized the Live Data selections.

6. Use the **DTC** and **FF** buttons to scroll to the "previous" and "next" frames of data, respectively.
7. When you have finished viewing the recorded Live Data, press the **LD** button to exit the “Live Data Playback” mode.

CODE RETRIEVAL PROCEDURE

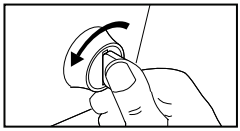
System Selection

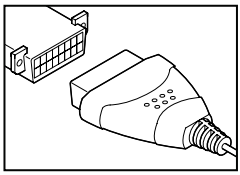
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Check the vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 2 for connector location.

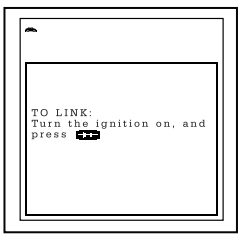




Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.

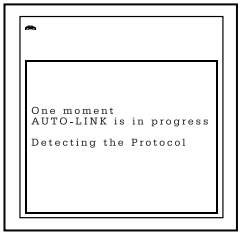
*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*

3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.
   - If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
   - If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, the "To Link" screen displays.
   - If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.



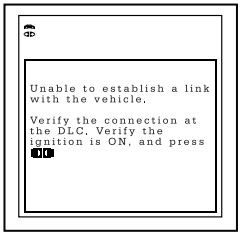
- If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer (PCM) fuse/circuit, and perform any necessary repairs before proceeding.

6. Press the **POWER/LINK** button. The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.



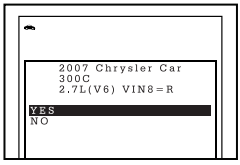
A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

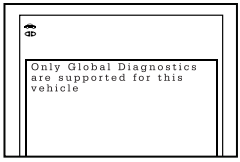


7. Once the vehicle's communication protocol has been determined, the Scan Tool performs a "VIN check" to identify the vehicle.

- If the Scan Tool is able to identify the vehicle, the Confirm Vehicle screen displays.
- If the correct vehicle is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



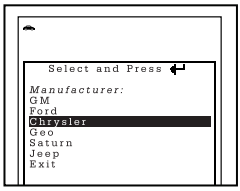
- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 15 to select the type of data you wish to view.
- If enhanced diagnostics *are not supported* by the vehicle, an advisory message shows momentarily on the Scan Tools display.



- If the correct vehicle *is not* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.
  - The Select Vehicle Origin screen displays.

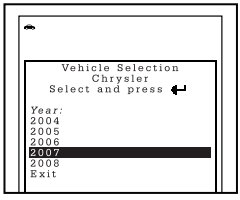
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired country of origin, then press the **ENTER** ↵ button.

- The Select Manufacturer screen displays



9. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Chrysler**, then press the **ENTER** ↵ button.

- The Select Model Year screen displays.



10. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

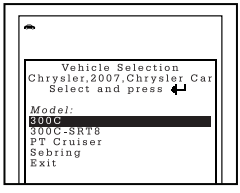
- The Select Make screen displays.

11. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

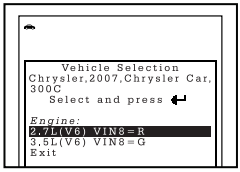
- The Select Model screen displays.

12. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.

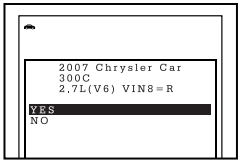
- The Engine Size screen displays.



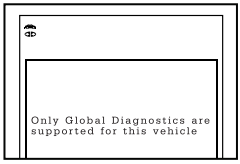
13. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired engine size, then press the **ENTER** ↵ button to continue.



- The Confirm Vehicle screen displays.
- If the correct vehicle *is* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.
- If enhanced diagnostics *are not* supported by the vehicle, an advisory message shows momentarily on the Scan Tools display. Proceed to step 15 to view global DTCs.

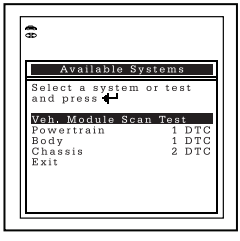


- If the correct vehicle is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Manufacturer screen and re-enter the appropriate vehicle information.

14. If the vehicle supports both Global and enhanced diagnostics, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OEM Enhanced**, then press the **ENTER** ↵ button.

You can return to the Select Data Type screen at any time to revise you selection (as long as the Scan Tool is connected to the vehicle) by pressing ***POWER/LINK*** ⏻ *button.*

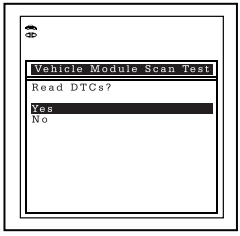
15. When **OEM Enhanced** is chosen from the Select Data Type screen, the Available Systems screen displays. The screen lists all systems from which you can retrieve data, and shows the current number of DTCs stored for each system.



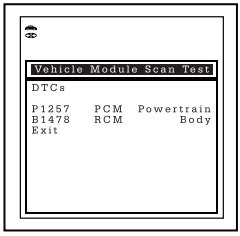
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button to continue.
- If **Veh. Module Scan Test** is selected, refer to Vehicle Module Scan Test on page 55 to continue.
- If **Powertrain** is selected, refer to Retrieving Powertrain Enhanced Data on page 55 to continue.

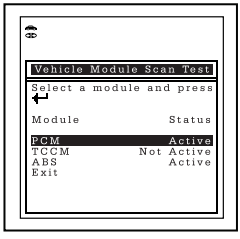
- If **Body** is selected, refer to Retrieving Body Enhanced Data on page 58 to continue.
- If **Chassis** is selected, refer to Retrieving Chassis Enhanced Data on page 59 to continue.

Vehicle Module Scan Test

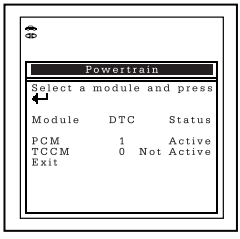


1. When **Vehicle Module Scan Test** is selected from the Available Systems screen, the Vehicle Module Scan Test screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.
2. If **Yes** is selected, the Vehicle Module Scan Test DTCs screen displays. The screen shows a listing of DTCs stored in all available systems.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the Available Systems screen.
3. If **No** is selected, the Vehicle Module Scan Test Status screen displays. The screen shows the current status for each available system.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the Available Systems screen.





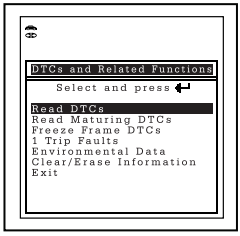
Retrieving Powertrain Enhanced Data



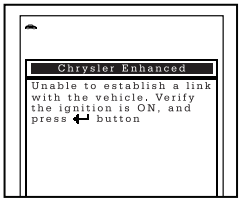
1. When **Powertrain** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.

- The DTCs and Related Functions screen displays. The available options listed depend on the protocol used to communicate with the vehicle. You may also choose to erase powertrain DTCs and related data (see ERASING ENHANCED DATA on page 64 for details).

2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.



- The Scan Tool retrieves the selected information.
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
  - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 51 more information).



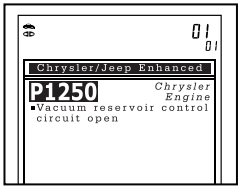
3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

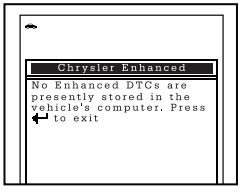
I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

Read DTCs

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.



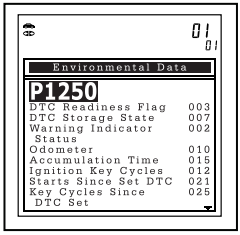
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** ↵ button to return to the Chrysler Enhanced menu.



- When you are finished viewing the retrieved data, press the **DTC** button to return to the previous menu.

Environmental Data

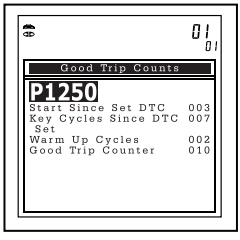
- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related environmental data (counts) are shown in the lower section of the LCD display.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** ↵ button to return to the Chrysler Enhanced menu.

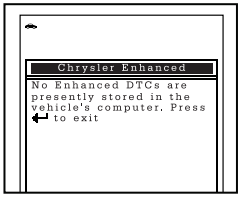


- When you are finished viewing the retrieved data, press the **DTC** button to return to the previous menu.

Good Trip Counts

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related "good trip" counts are shown in the lower section of the LCD display.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** (G) button to return to the Chrysler Enhanced menu.

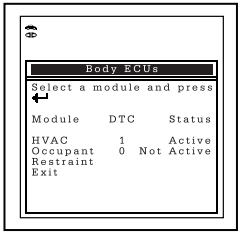




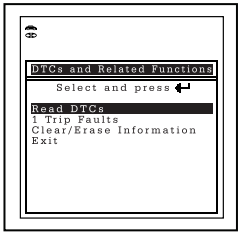
- When you are finished viewing the retrieved data, press the **DTC** button to return to the previous menu.

1. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 61 for details).
2. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 62 for details).
3. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 63 for details).
4. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

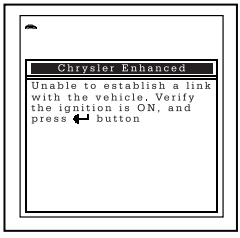
Retrieving Body Enhanced Data



1. When **Body** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** and **DOWN** buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** button.
   - The DTCs and Related Functions screen displays. You may also choose to erase powertrain DTCs and related data (see ERASING ENHANCED DATA on page 64 for details).



2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER** button.
   - The Scan Tool retrieves the selected information.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).



3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

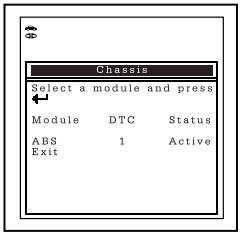
- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press any HotKey button to continue.

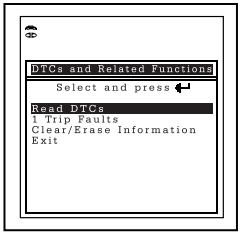
4. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 61 for details).
5. If desired, press **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 62 for details).
6. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 63 for details).
7. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information)

Retrieving Chassis Enhanced Data

1. When **Chassis** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.

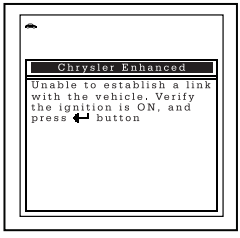


- The DTCs and Related Functions screen displays. You may also choose to erase powertrain DTCs and related data (see ERASING ENHANCED DATA on page 64 for details).



2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.

- The Scan Tool retrieves the selected information.
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
  - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

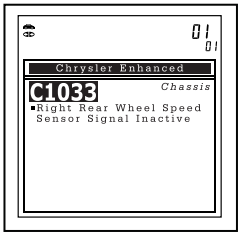


3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible 🚗 icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press any HotKey button to continue.



4. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 62 for details).

5. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 63 for details).
6. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

VIEWING FREEZE FRAME DATA

In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data.

When viewing Chrysler "enhanced" powertrain DTCs, you may also view "enhanced" Freeze Frame data. The vehicle's computer may store multiple Freeze Frames.

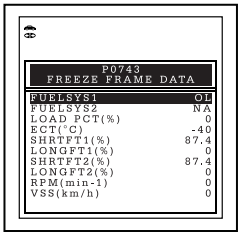
1. While viewing Chrysler "enhanced" Powertrain DTCs, press the **FF** button.

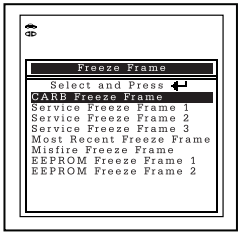
   - If a single Freeze Frame has been saved, the Freeze Frame screen displays.
   - If more than one Freeze Frame has been saved, a Freeze Frame menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the Freeze Frame you wish to view, then press the **ENTER** ↵ button.

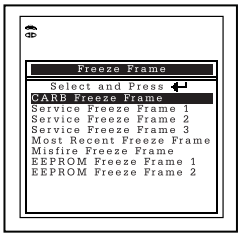
   The options available through the Freeze Frame menu differ depending on the vehicle's communication protocol.

   - If more than one Freeze Frame has been saved, a Freeze Frame menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the Freeze Frame you wish to view, then press the **ENTER** ↵ button.

   The options available through the Freeze Frame menu differ depending on the vehicle's communication protocol.



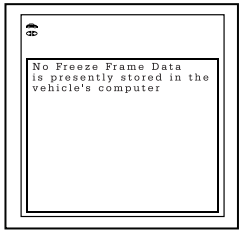




2. Saved engine conditions may include but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate and intake manifold pressure.

3. If more than one Freeze Frame was saved, press the **FF** button to return to the Freeze Frame menu to select another Freeze Frame for viewing.

*If no Freeze Frame data is present, the message "No Freeze Frame Data is presently stored in the vehicle's computer" displays. Press the **POWER/LINK** button to return to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).*



VIEWING LIVE DATA

The OBD2 Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

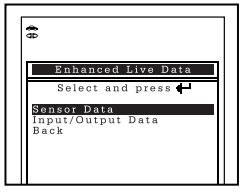
Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.

- The Select Data Type screen displays.

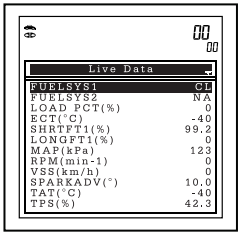
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the type of data you wish to view, then press the **ENTER** ↵ button.



- The Live Data screen displays.

*When the **LD** button is pressed with the Scan Tool in "enhanced" mode, a list of options for which you can view Live Data may display, depending on the vehicle make and the controller with which the Scan Tool is communicating. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired option, then press the **ENTER** ↵ button to display the Live Data screen. Press the **LD** button to return to the options list.*

3. Real-time Live Data (PID) information supported by the vehicle under test displays.



Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

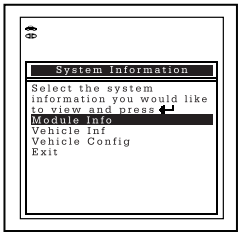
4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.

- If desired, press and release the **LD** button to return to the Select Data Type screen to select another data type.
- If desired, press and hold the **LD** button to display the Live Data Menu (see Live Data Mode on page 41 for details).

5. To exit the enhanced mode, press the **POWER/LINK** ⏻ button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

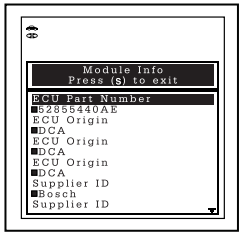
SYSTEM TEST

The System Test function lets you view module information for the vehicle under test.



1. While linked to the vehicle, press and release the **SYSTEM TEST** Ⓢ button.
   - The System Test menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the information you wish to view, then press the **ENTER** ↵ button.
   - The System Information screen displays.

3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired selection, then press the **ENTER** ↵ button.



4. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

ERASING ENHANCED DATA

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 51 and select the system from which you wish to erase data from the Available Systems screen.
   - The DTCs and Related Functions screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase Information**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.

   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.
   - If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.
4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.
   - If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.

- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.

Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

CHRYSLER/JEEP OBD1 SYSTEMS

Chrysler Motors On-Board Computer Systems

Chrysler Motors introduced its first electronic fuel injected vehicle in late 1983. The on-board computer management systems used on Chrysler vehicles have evolved over the years, and their names have changed accordingly.

1983-87: The on-board computer used in these vehicles is a split-system, composed of two separate units: the Logic Module and the Power Module. The Logic Module contains a microprocessor which processes data received from sensors located throughout the vehicle and makes decisions (based on these inputs) which effect engine operation. The Logic Module is usually located on the right-hand side, behind the kick panel. The Power Module supplies operating power to the Logic Module, and contains the circuits which control the high-current devices. Power Module operation is controlled by the Logic Module. The Power Module is located in the engine compartment, near the vehicle's battery.

1987-90: This system is called a Single Module Engine Controller (SMEC). This system still uses two separate circuit boards (Logic Module and Power Module). However, both circuit boards are located in a common enclosure.

1989-95: This system is called a Single Board Engine Controller (SBEC). On this system, the Logic Module and Power Module circuit boards are integrated on a single circuit board.

1993-97: Beginning in 1993, the computer was renamed the Powertrain Control Module (PCM). In addition to controlling the engine management system and emission system, the computer also takes an active role in controlling powertrain (transmission system) operation.

Unless otherwise specified, all references to "computer" within this manual also apply to "Logic Module/ Power Module", "SMEC", "SBEC" or "PCM".

Jeep On-Board Computer Systems

1993-95: In 1993, Jeep on-board computer systems (fuel injected vehicles only) were converted to the Chrysler on-board computer systems. All 1993 through 1995 fuel injected Jeep and Chrysler vehicles are equipped with similar on-board computer systems.

VEHICLES COVERED

This section covers Chrysler fuel injected vehicles from 1983-1995.

Type	Model Year	Model
Passenger Cars	1983-1995	Chrysler, Dodge and Plymouth Fuel Injected Models Only (Excluding Lasor/Talon 1.8L, 2.0L (ALL YEARS), 1990 Monaco/Premier, 1993-1995 Intrepid, LHS, Concorde and Vision, 1995 Avenger, Stealth (ALL YEARS) and Cirrus 2.5L (ALL YEARS))
Light Truck and Vans	1987-1995	Chrysler, Dodge and Plymouth Fuel Injected Models Only
	1992-1995	Diesel Models
Jeep	1993-1995	Jeep Fuel Injected Models Only

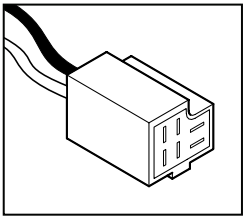
INSTRUMENT PANEL INDICATOR LIGHTS

Your vehicle's instrument panel has either a "Power Loss", "Check Engine" or "Malfunction Indicator Lamp", depending on the year of the vehicle. These lights are designed to warn you of component malfunctions.

If your instrument panel indicator lights do not come on when you turn on the ignition, please refer to your vehicle's service manual. You may have problems in the car's circuitry. It is recommended that you fix these problems before retrieving DTC's from your vehicle's computer.

DATA LINK CONNECTOR (DLC)

Chrysler vehicles are equipped with special test connectors that make it possible to connect specialized testing equipment that communicates with the vehicle's on-board computer. Chrysler's vehicle test connectors are usually dark in color (BLACK or GREY) and are located under the hood.



CODE RETRIEVAL PROCEDURE

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

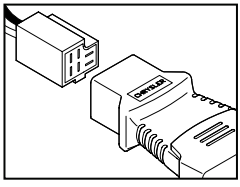
Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Locate the vehicle's Data Link Connector (DLC). See DATA LINK CONNECTOR (DLC) on page 67 for connector location.

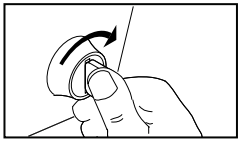
Some DLCs have a plastic cover that must be removed before connecting the Tool's cable connector.

2. Connect the Tool cable (with the Chrysler Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** button to turn the Tool ON.



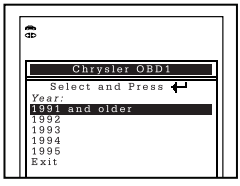
   - Set the parking brake, and make sure all vehicle accessories are turned off.

3. Turn the ignition ON. **DO NOT** start the engine.

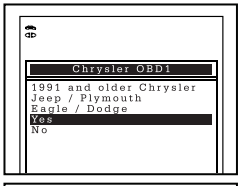


   - The Select Model Year screen displays.

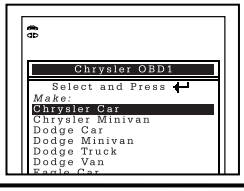
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the model year of the vehicle, then press the **ENTER** ↵ button.



   - If the model year selected is **1992** or newer, the Select Vehicle Make screen displays. Proceed to step 5.
   - If the model year selected is **1991 and older**, a confirmation screen displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes** or **No**, as appropriate, then proceed to step 8.

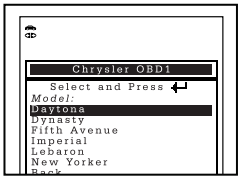


5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the vehicle make, then press the **ENTER** ↵ button to continue.

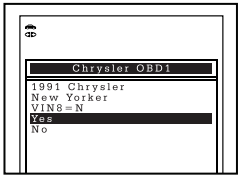


   - The Select Vehicle Model screen displays.

6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the vehicle model, then press the **ENTER** ↵ button to continue.



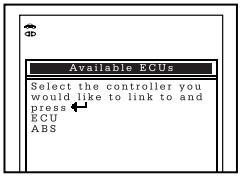
- A confirmation screen displays. The screen shows the selected year, make and model for the vehicle.



7. If the information shown on the confirmation screen is correct, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight Yes, then press the **ENTER** ↵ button to continue.

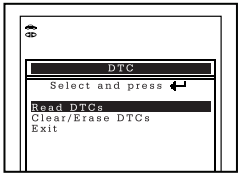
- If the information shown on the confirmation screen is not correct, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight No, then press the **ENTER** ↵ button to return to the Select Model Year screen. Repeat steps 4 through 7.

8. The Available ECUs screen displays.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button to continue.

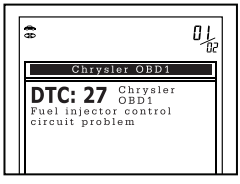
9. The DTC Menu screen displays.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button to continue.

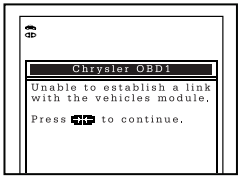
10. Prepare the vehicle to retrieve codes:

- **For 1988-1995 Chrysler/Jeep vehicles:** The Tool will automatically begin the code retrieval process. Proceed to step 10 to continue.
- **For 1984-1988 Chrysler vehicles ONLY:** WITHOUT starting the engine, turn ignition ON, OFF, ON, OFF and ON again within 5 seconds to activate the code retrieval process. Proceed to step 10 to continue.



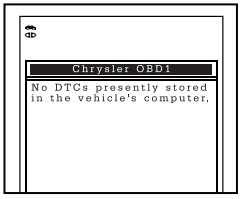
11. The Scan Tool will retrieve and display any Diagnostic Trouble Codes from the vehicle's computer memory.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.

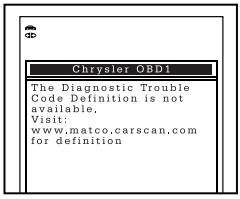


- Verify the connection at the DLC, and verify the ignition is ON.
- Press the **POWER/LINK** button to return to the Available Modules screen and repeat steps 8 through 10.

■ The Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No DTC's are presently stored in the vehicle's computer" message is displayed.



If the definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's LCD display.



12. If more than one code was retrieved, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional codes.

13. Disconnect the Tool from the vehicle and turn the ignition key OFF.

14. To prolong battery life, the Tool automatically shuts "Off" after approximately three minutes of no button activity. The DTCs retrieved will remain in the Tool's memory, and may be viewed at any time. If the Tool's batteries are removed, or if the Tool is re-linked to a vehicle to retrieve codes, any prior codes in its memory are automatically cleared.

15. Follow the testing and repair procedures outlined in the vehicle's service repair manual to correct "hard" DTCs. Codes should be addressed and eliminated in the order they were received, erasing (see ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 72) and retesting after each repair is made to be sure the fault was eliminated.

The green, yellow and red LEDs are used (with the LCD display) as visual aids to make it easier to determine engine system conditions. See SERVICING DTCs on page 74 for information on interpreting LEDs and servicing DTCs.

VIEWING LIVE DATA

The Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle

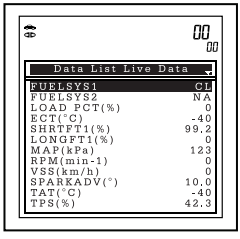
system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.



- The Select PID Group screen displays. The available options depend on the controller to which the Scan Tool is currently linked.

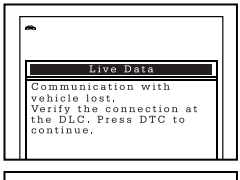
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired PID group, then press the **ENTER** ↵ button.

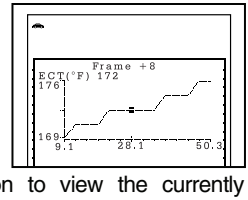
- The LIve Data screen displays.

3. Real-time Live Data (PID) information supported by the vehicle under test displays.

Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.

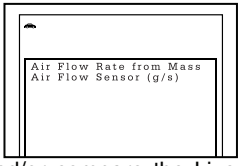




- If communication with the vehicle is lost while viewing Live Data, a Communication Lost" message shows on the Scan Tool's display.

5. Press and release the **ENTER** ↵ button to view the currently selected PID in “graph” mode. Press and release the **ENTER** ↵ button again to return to the PID list.

6. Press and hold the **ENTER** ↵ button to view the "expanded" definition for the currently selected PID. Press and release the **ENTER** ↵ button again to return to the PID list.



7. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Scan Tool to specifications in the vehicle's repair manual.

If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See ***Customizing Live Data (PIDs)*** *below for details. You may also choose to "capture" (record) Live Data for later viewing. See Live Data Mode on page 41 for details.*

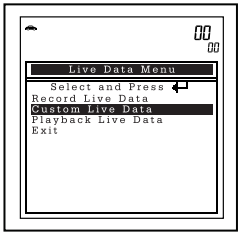
CUSTOMIZING LIVE DATA (PIDs)

This feature lets you customize the Scan Tool display to show only those PIDs that are of interest at the current time. You can customize the Live Data display by placing the Scan Tool in "Custom Live Data" mode and selecting only the PIDs that you wish to display. To customize the Live Data display, proceed as follows:

1. While linked to the vehicle, start the engine, then press and release the **LD** button.

- The Select PID Group screen displays. The available options depend on the controller to which the Scan Tool is currently linked.

2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired PID group, then press the **ENTER** ↵ button.

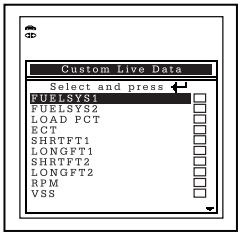


- The LIve Data screen displays.

3. Press and release the **LD** button.

- The Custom Live Data menu displays, with the first PID in the menu highlighted.

4. Use the **UP** ▲ and **DOWN** ▼ buttons to scroll through the available PIDs. When the PID you wish to display is highlighted, press the **ENTER** ↵ button to select it (a "checkmark" will show in the checkbox to the right of the PID to confirm your selection). Repeat the procedure until only the PIDs you want to display have all been selected.



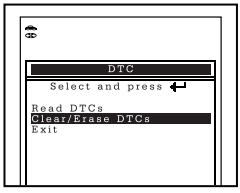
- To deselect a currently selected PID, highlight the PID, then press the **ENTER** ↵ button. The checkmark will be removed from the checkbox.

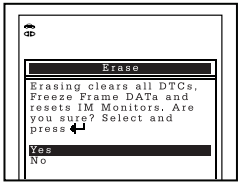
5. When you are finished making your selection(s), scroll to the end of the PID list and highlight the word **DONE**, then press the **ENTER** ↵ button.
   - The Scan Tool is now in "Custom Live Data" mode. Only the PIDs you selected are shown on the Scan Tools display. Pressing the **LD** button repeatedly will toggle between the "full" and "custom" Live Data displays.
6. To exit the "Custom Live Data" mode, press, hold and release the **LD** button, to return to the DTC screen.

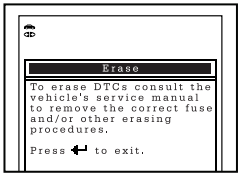
ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 68 and select the controller from which you wish to erase data from the Available Modules screen.
   - The DTC Menu screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.
   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.
   - If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.





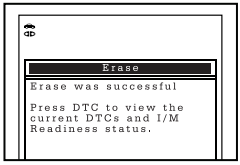

Erase
To erase DTCs consult the vehicle's service manual to remove the correct fuse and/or other erasing procedures.
Press ↵ to exit.

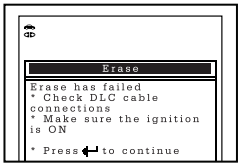
If erasing DTCs using a Scan Tool IS NOT supported by the vehicle, an instructional message displays. Refer to the vehicle's service manual forprocedures to erase DTCs from the vehicle's computer

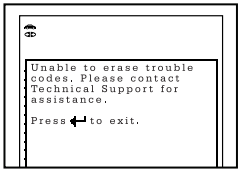
4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

5. If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.

- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.
- If the erase process fails continuously, an advisory message displays. Contact Technical Support for assistance.







Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

SERVICING DTCs

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Retrieved information can be uploaded to a Personal Computer (PC) with the use of optional software. For more information, see instructions included with the optional software.

CODE RETRIEVAL PROCEDURE

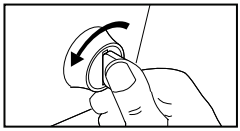
System Selection

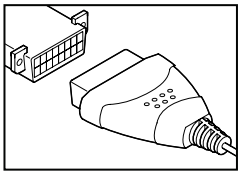
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Check the vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 2 for connector location.

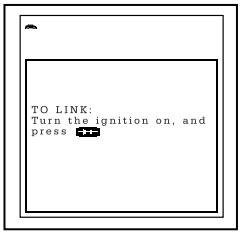




Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.

*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*

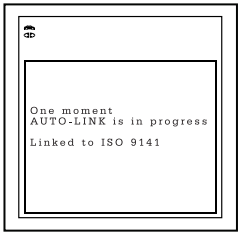
3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.
   - If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
   - If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, the "To Link" screen displays.



   - If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.
   - If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer

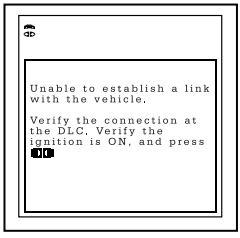
(PCM) fuse/circuit, and perform any necessary repairs before proceeding.

6. Press the **POWER/LINK** button. The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.



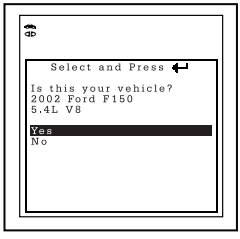
A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.



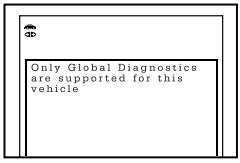
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

7. Once the vehicle's communication protocol has been determined, the Scan Tool performs a "VIN check" to identify the vehicle.

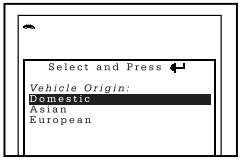


- If the Scan Tool is able to identify the vehicle, the Confirm Vehicle screen displays.
- If the correct vehicle is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.
  - If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.

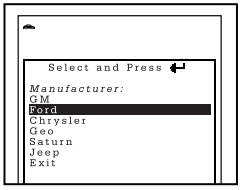
- If enhanced diagnostics *are not supported* by the vehicle, an advisory message shows momentarily on the Scan Tools display.



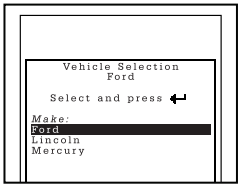
- If the correct vehicle *is not* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.
  - The Select Vehicle Origin screen displays.



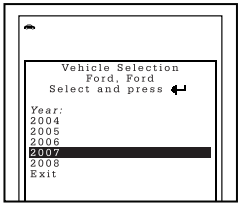
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired country of origin, then press the **ENTER** ↵ button.
   - The Select Manufacturer screen displays.



9. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Ford**, then press the **ENTER** ↵ button.
   - The Select Make screen displays.

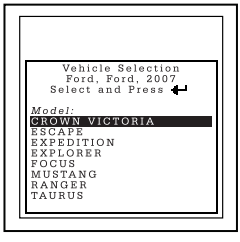


10. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.
    - The Select Model Year screen displays.

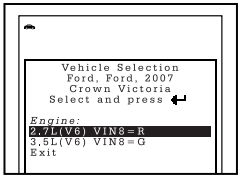


11. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model year, then press the **ENTER** ↵ button.
    - The Select Model screen displays.

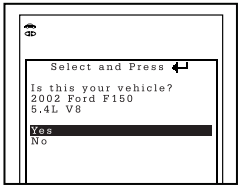
12. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.
    - The Select Engine screen displays.

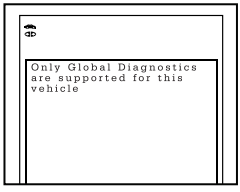


13. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired engine size, then press the **ENTER** ↵ button.
    - The Confirm Vehicle screen displays.
    - If the correct vehicle *is* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



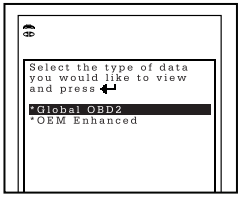
- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.
- If enhanced diagnostics *are not* supported by the vehicle, an advisory message shows momentarily on the Scan Tools display.
- If the correct vehicle is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Manufacturer screen and re-enter the appropriate vehicle information.



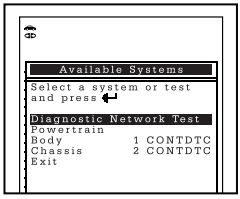


14. If the vehicle supports both Global and enhanced diagnostics, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OEM Enhanced**, then press the **ENTER** ↵ button.

You can return to the Select Data Type screen at any time to revise you selection (as long as the Scan Tool is connected to the vehicle) by pressing ***POWER/LINK*** ⏻ *button.*



15. When **OEM Enhanced** is chosen from the Select Data Type screen, the Available Systems screen displays. The screen lists all systems from which you can retrieve data, and shows the current number of DTCs stored for each system.

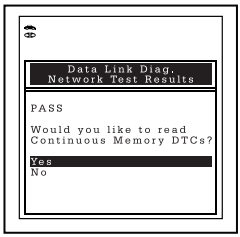


- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button to continue.
- If **Diagnostic Network Test** is selected, refer to Diagnostic Network Test on page 78 to continue.
- If **Powertrain** is selected, refer to Retrieving Powertrain Enhanced Data on page 79 to continue.
- If **Body** is selected, refer to Retrieving Body Enhanced Data on page 81 to continue.
- If **Chassis** is selected, refer to Retrieving Chassis Enhanced Data on page 83 to continue.

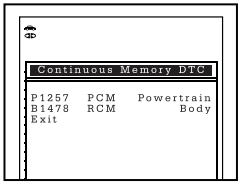
Diagnostic Network Test

1. When **Diagnostic Network Test** is selected from the Available Systems screen, the vehicle performs a self-test of all available controllers. When the test is complete, the Data Link Diagnostic Network Test Results screen displays.

2. If the Diagnostic Network passed the test, the "PASS" screen displays.

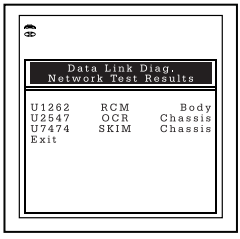


   - If you wish to view Continuous Memory DTCs, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. The Continuous Memory DTCs screen displays.



     - The screen shows a listing of all Continuous Memory DTCs, along with the controller in which each DTC is stored. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the Available Systems screen.

   - If you do not wish to view Continuous Memory DTCs, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Available Systems screen.



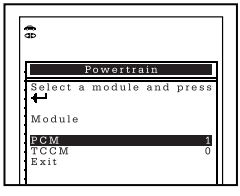
3. If the Diagnostic Network did not pass the test, a screen listing DTCs associated with the failure displays.

   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight a DTC in the list, then press the **ENTER** ↵ button to view recommended actions to correct the problem.

   - To return to the Available Systems screen, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button.

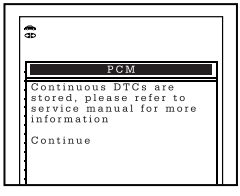
Retrieving Powertrain Enhanced Data

1. When **Powertrain** is selected from the Available Systems screen, the Available Modules screen displays.

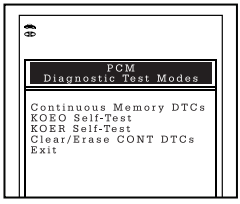


   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.

   - If Continuous DTCs are currently stored in the selected controller, an advisory message displays. Refer to the vehicle's service manual for additional information. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Continue**, then press the **ENTER** ↵ button.

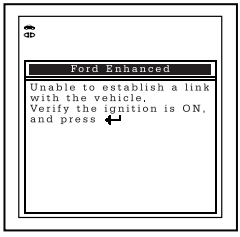


2. The Diagnostic Test Modes menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.



*When choosing to view **KOER Test DTCs**, start the vehicle's engine before making your selection.*

- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.



  - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

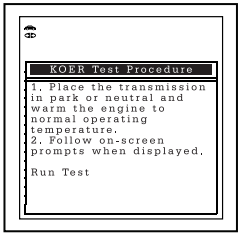
- If **KOEO Self-Test** or **KOER Self-Test** is selected, the LCD display shows instructions to prepare the vehicle for the selected test. Proceed to step 3.
- If **Continuous Memory DTCs** is selected, proceed to step 5.

3. To prepare the vehicle for the KOEO Test:

KOEO Test Procedure
1. Place transmission in park or neutral and warm to normal operating temperature.
2. Turn ignition OFF and wait 10 seconds.
3. Turn ignition ON, but do NOT start the engine.
*Clicking sounds may be heard from relays and solenoids
*Electric fan may be

- Place the transmission in park or neutral. Start and warm-up engine to normal operating temperature.
- Turn the ignition off. Wait 10 seconds then turn the ignition on. DO NOT start the engine.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Continue**, then press the **ENTER** ↵ button. Proceed to step 5.

4. To prepare the vehicle for the KOER Test:


KOER Test Procedure
1. Place the transmission in park or neutral and warm the engine to normal operating temperature.
2. Follow on-screen prompts when displayed.
Run Test

- Place the transmission in park or neutral. Start and warm-up engine to normal operating temperature.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Run Test**, then press the **ENTER** ↵ button. Proceed to step 5.
- Follow the on-screen prompts to perform KOER test procedures. Proceed to step 5.

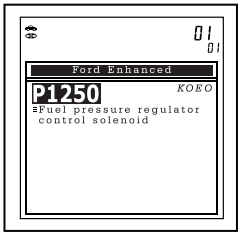
5. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.

6. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** ↵ button to return to the Ford Enhanced menu.

- When you have scrolled through all retrieved DTCs, the Scan Tool returns to the Ford Enhanced menu.

7. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 85 for details).

8. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 85 for details).

9. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 87 for details).

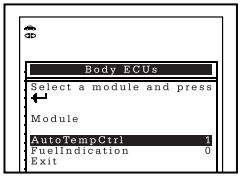
10. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

Retrieving Body Enhanced Data

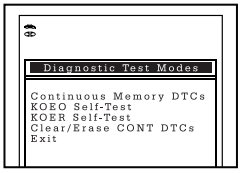
1. When **Body** is selected from the Available Systems screen, the Available Modules screen displays.

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.

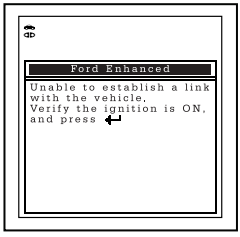
- If Continuous DTCs are currently stored in the selected controller, an advisory message displays. Refer to the vehicle's service manual for additional information. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Continue**, then press the **ENTER** ↵ button.



2. The Diagnostic Test Modes menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.



- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
  - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).



- If **On-Demand Self-Test** is selected, the LCD display shows instructions to prepare the vehicle for the selected test. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Run Test**, then press the **ENTER** ↵ button.

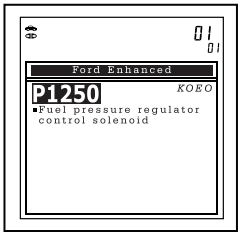
3. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.

4. To read the display:

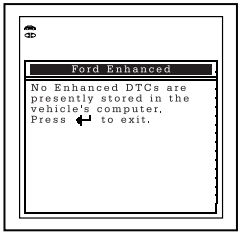
Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible 🚗 icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.



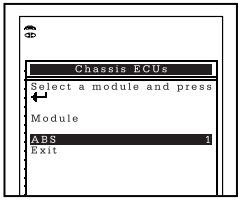
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.



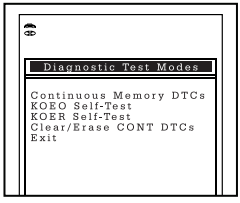
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** ↵ button to return to the Ford Enhanced menu.
- Press the **DTC** button to return to the Diagnostic Test Modes screen.

5. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 85 for details).
6. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 85 for details).
7. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 87 for details).
8. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

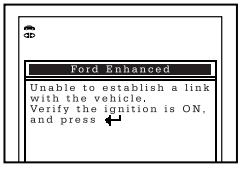
Retrieving Chassis Enhanced Data



1. When **Chassis** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.
   - If Continuous DTCs are currently stored in the selected controller, an advisory message displays. Refer to the vehicle's service manual for additional information. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Continue**, then press the **ENTER** ↵ button.



2. The Diagnostic Test Modes menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.



- Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

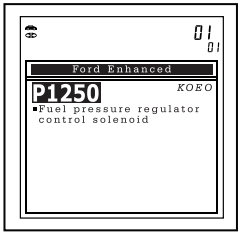
- If **On-Demand Self-Test** is selected, the LCD display shows instructions to prepare the vehicle for the selected test. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Run Test**, then press the **ENTER** ↵ button.

3. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.

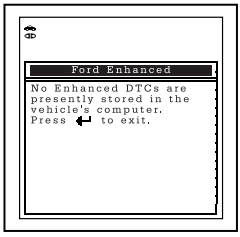
4. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing en-hanced DTCs.



- A visible 🚗 icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **ENTER** ↵ button to return to the Ford Enhanced menu.



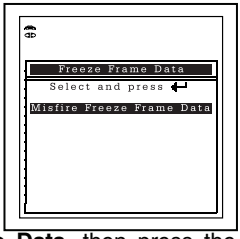
- When you have scrolled through all retrieved DTCs, the Scan Tool returns to the Ford Enhanced menu.
- If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 85 for details).
- If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 85 for details).

5. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 87 for details).
6. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).

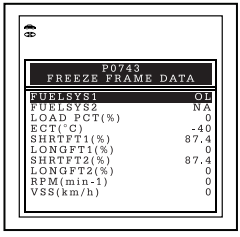
VIEWING FREEZE FRAME DATA

In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data.

When viewing Ford "enhanced" powertrain DTCs, you may also view "enhanced" Freeze Frame data. The vehicle's computer may store multiple Freeze Frames.



1. While viewing Ford "enhanced" Powertrain DTCs, press the **FF** button.
   - The Freeze Frame Data menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select **Misfire Freeze Frame Data**, then press the **ENTER** ↵ button.
   - The Freeze Frame screen displays.



3. Saved engine conditions may include but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate and intake manifold pressure.
4. Press the **FF** button to return to the Freeze Frame menu.

VIEWING LIVE DATA

The OBD2 Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

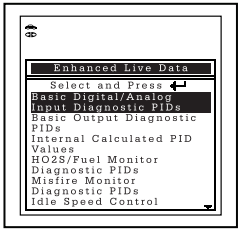
In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

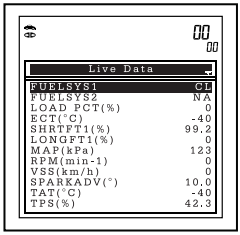
The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Enhanced Live Data screen displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the type of data you wish to view, then press the **ENTER** ↵ button.
   - The Live Data screen displays.
3. Real-time Live Data (PID) information supported by the vehicle under test displays.



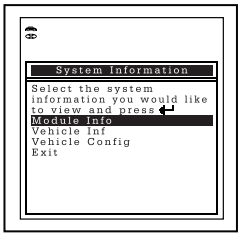


Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

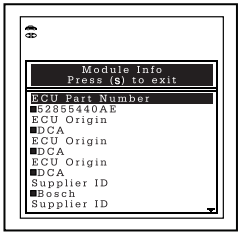
4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.
5. If desired, press and release the **LD** button to return to the Select Data Type screen to select another data type.
6. If desired, press and hold the **LD** button to display the Live Data Menu (see Live Data Mode on page 41 for details).

SYSTEM TEST

The System Test function lets you view module information for the vehicle under test.



1. While linked to the vehicle, press and release the **SYSTEM TEST** Ⓢ button.
   - The System Test menu displays.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the information you wish to view, then press the **ENTER** ↵ button.
   - The System Information screen displays.

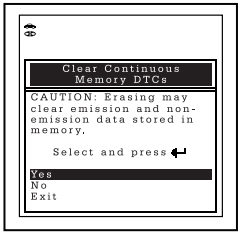


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired selection, then press the **ENTER** ↵ button.
4. To exit the enhanced mode, press the **POWER/LINK** ⏻ button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

ERASING ENHANCED DATA

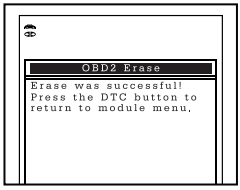
The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 75 and select the controller from which you wish to erase data from the Available Systems screen.
   - The Diagnostic Test Modes menu displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase CONT DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.
   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.

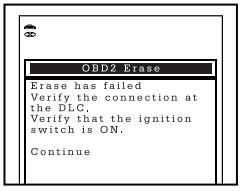


- If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.

4. If you chose to continue, a progress screen displays while the erase function is in progress.



- If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.



- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.

Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

FORD COMPUTER SYSTEM OVERVIEW

IMPORTANT: *When the computer is in Self-Test mode (is testing the sensors or actuators for proper operation), it relies on voltage signals that is sends to and / or receives from the sensors or actuators to determine whether or not these components are operating properly. The sensors and actuators are all connected to the computer by wires. If any defects are present in any part of the circuit that connects these devices to the computer (such as defective connectors or wires, faulty grounds, improper voltage, shorts etc.), the voltage signal that the computer receives from these devices will be affected. The computer has no way of determining if the improper voltage signal is being caused by a defect in the circuit or by the sensors or actuators themselves. Keep this in mind when servicing fault codes, and do not replace any devices (sensors or actuators) before checking the complete circuit (or circuits) that are part of the device from which the code was generated.*

VEHICLES COVERED

CAR - Ford, Lincoln, Mercury Computer System/Tool Application Table

The following table lists the year and model of all the cars that are covered by the OBD2 & 1 Tool.

Engine	8th VIN Digit**	Fuel Systems (Carburetor Model)	Application/Special Notes	Computer System
1981-1982				
1.6L I-4	5, 2	EFI, EFI Turbo	Escort, EXP, LN7, Lynx	EEC-IV
2.3L I-4	5	EFI Turbo	Capri, Cougar, Mustang, T-Bird	
2.3L I-4 HSC	R, J	FBC (6149)*	Capri, Fairmont, LTD, Marquis, Mustang, Tempo, Topaz, Zephyr	
1984-1986				
1.6L I-4	4, 5, 8	EFI EFI Turbo	Escort, EXP, Lynx	EEC-IV
2.3L I-4 2.3L I-4 OHC	A, J, R	FBC (YFA)* (6149)*	Capri, Cougar, LTD, Marquis, Mustang, Tempo, Topaz	
2.3L I-4	T, W	EFI Turbo	Capri, Cougar, Merkur XR4Ti, Mustang, T-Bird	
2.3L I-4 HSC	S, X	CFI	Tempo, Topaz	
3.8L V-6	3	CFI	Capri, Cougar, LTD, Marquis, Mustang, T-Bird	

Engine	8th VIN Digit**	Fuel Systems (Carburetor Model)	Application/Special Notes	Computer System
1984-1986 (Cont)				
5.0L V-8	F, M	CFI, SEFI	Capri, Continental, Colony Park, Cougar, Country Squire, Crown Victoria, Grand Marquis, LTD, Mark VII, Marquis, Mustang, T-Bird, Town Car	EEC-IV
1987-1993				
1.9L I-4	J, 9	EFI, CFI, SFI	Escort, EXP, Lynx, Tracer	EEC-IV
2.0L I-4	A	SEFI	Probe (1993 manual transmission only)	
2.3L I-4	A	FBC (YFA)*	Capri, LTD, Marquis, Mustang (1996 models)	
2.3L I-4 OHC	A, M	EFI	Mustang	
2.3L I-4	T, W	EFI Turbo	Capri, Cougar, Merkur, Mustang, T-Bird, XR4Ti	
2.3L I-4 HSC	S, X	CFI, EFI, SEFI	Tempo, Topaz	
2.5L I-4	D	EFI, CFI	Sable, Taurus	
3.0L V-6 3.0L V-6 SHO	1, U, Y	EFI, SEFI, SFI	Probe, Sable, Taurus, Tempo, Topaz (VIN 1 Taurus models are Flexible Fuel)	
3.8L V-6	3, 4, C, R	CFI, EFI, SFI	Capri, Continental, Cougar, LTD, Marquis, Mustang, Sable, T-Bird,Taurus	
4.6L V-8	W, V	SEFI	Crown Victoria, Grand Marquis, Mark VII, Town Car	
5.0L V-8	F, M, E, T, D, 4	SEFI	Capri, Continental, Cougar, Crown Victoria, Grand Marquis, Mark VII, Mustang, Mustang Cobra, T-Bird, Town Car	
1994				
1.9L I-4	J	SFI	Escort, Topaz, Tracer	EEC-IV
2.0L I-4	A	SFI	Probe	
3.0L V-6	1, U, Y	SFI	Sable, Taurus, Tempo (VIN 1 Taurus models are Flexible Fuel)	
3.8L V-6 3.8L V-6 SC	4 R	SFI	Continental, Cougar, Sable, Taurus, T-Bird	
4.6L V-8	W, V	SFI	Crown Victoria, Grand Marquis, Mark VIII, Town Car	
5.0L V-8	T, D	SFI	Mustang, Mustang Cobra	
1995				
1.9L I-4	J	SFI	Escort, Tracer	EEC-IV
2.0L I-4	A, 3	SFI	Contour, Mystique, Probe	
2.5L V-6	L	SFI	Contour, Mystique	
3.0L V-6	1, U	SFI	Sable, Taurus (VIN 1 Taurus models are Flexible Fuel)	
3.0L V-6 SHO	Y			
3.8L V-6	4	SFI	Cougar, Sable, Taurus, T-Bird	
3.8L V-6 SC	R			

Engine	8th VIN Digit**	Fuel Systems (Carburetor Model)	Application/Special Notes	Computer System
1995 (Cont)				
4.6L V8 DOHC	V	SFI	Mark VIII	EEC-IV
5.0L V-8 HO	T	SFI	Mustang	
5.0L V-8 SHP	D			

NOTES

*** Carburetor Model.** Carburetor model numbers are usually stamped on top of the carburetor, or on a metal tab attached to the carburetor. Consult your vehicle's repair manual for proper identification.

****VIN Number.** The VIN number(s) used in this column identify the vehicle's engine type. This number is the 8th digit of the VIN (Vehicle Identification Number). Consult your vehicle's repair manual for details.

Application Table Definitions. CFI = Central Fuel Injection; DOHC = Dual Overhead Cam; EFI = Electronic Fuel Injection; FBC = Feedback Carburetor; HSC = High Swirl Combustion; MFI = Multiport Fuel Injection; OHC = Overhead Cam; SC = Super Charged; SEFI = Sequential Electronic Fuel Injection; SFI = Sequential Fuel Injection; SHO = Super High Output

TRUCKS/VANS - Ford Computer System Tool Application Table

The following table lists the year and model of all the trucks and vans that are covered by the OBD2 & 1 Tool.

Engine	8th VIN Digit**	Fuel Systems (Carburetor Model)	Application/Special Notes	Computer System
1983				
2.8L V-6	S	FBC (2150A)*	Bronco II and Ranger Pickup	EEC-IV
1984				
2.8L V-6	S	FBC (2150A)*	Bronco II, Ranger Pickup	EEC-IV
4.9L I-6	Y	FBC (YFA)*	Bronco, E and F Series Trucks/Vans (8500 lb. GVW or less only)	
5.0L V-8	F	FBC (2150A)*		
5.8L V-8	G	FBC (2150A)*		
1985-1990				
2.3L I-4 OHC	A	EFI	Aerostar, Bronco II, Ranger (excluding Diesel)	EEC-IV
2.9L V-6	T	EFI		
2.8L V-6	S	FBC (2150A)*	Bronco, E and F Series Trucks/Vans (8500 lb. GVW or less only)	
4.9L I-6	Y, 9	FBC (YFA)*, EFI		
5.0L V-8	F	FBC (2150A)*		
5.0L V-8	N	EFI		
5.8L V-8	G	FBC (2150A)*	E and F Series Trucks/Vans (8500 lb. GVW or less only)	
7.3L V-8	M	Diesel		
7.5L V-8	G	EFI		
1991-1994				
2.3L I-4 OHC	A	EFI, MFI	Ranger	EEC-IV
2.9L V-6	T	EFI		
3.0L V-6	U	EFI, SEFI, SFI	Aerostar, Ranger	

Engine	8th VIN Digit**	Fuel Systems (Carburetor Model)	Application/Special Notes	Computer System
1991-1994 (Cont)				
4.0L V-6	X	EFI, MFI	Aerostar, Explorer, Ranger	EEC-IV
4.9L I-6	Y, H	EFI, MFI, SFI	Bronco, E and F Series Trucks/Vans (8500 lb. GVW or less only)	
5.0L V-8	N	EFI, MFI, SFI		
5.8L V-8	H, R	EFI, MFI, SFI		
7.3L V-8	M	Diesel	E and F Series Trucks/Vans (Excludes 1994 diesel models)	
7.3L V-8	K	Turbo Diesel		
7.5L V-8	G	EFI, MFI		
1995				
3.0L V-6	U	SFI	Aerostar (Excludes Explorer, Ranger and Windstar)	EEC-IV
4.0L V-6	X	SFI		
4.9L I-6	Y	SFI	E and F series Trucks and Vans (Excludes Natural Gas equipped vehicles)	
5.0L V-8	N	SFI	Bronco, E and F series Trucks and Vans	
5.8L V-8	H, R	MFI		
7.5L V-8	G	MFI	E-350; F-250-350 (Excludes California); F-Super Duty (Excludes Diesel)	

NOTES

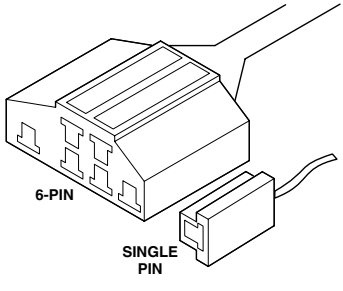
*** Carburetor Model.** Carburetor model numbers are usually stamped on top of the carburetor, or on a metal tab attached to the carburetor. Consult your vehicle's repair manual for proper identification.

****VIN Number.** The VIN number(s) used in this column identify the vehicle's engine type. This number is the 8th digit of the VIN (Vehicle Identification Number). Consult your vehicle's repair manual for details.

Application Table Definitions. EFI = Electronic Fuel Injection; FBC = Feedback Carburetor; MFI = Multiport Fuel Injection; OHC = Overhead Cam; SC = Super Charged; SEFI = Sequential Electronic Fuel Injection; SFI = Sequential Fuel Injection

TEST CONNECTORS

Ford vehicles are equipped with special test connectors that make it possible to connect specialized testing equipment that communicates with the vehicle's onboard computer. Ford's vehicle test connectors are usually dark in color (BLACK or GREY). Sometimes they have a plastic cover over them or are labeled EEC Test. The connectors can be found in the following general locations in the engine compartment:



EEC-IV TEST CONNECTOR

- Near the front corner (right or left).
- Near the fender well (right or left).
- Near the fire wall (right or left).

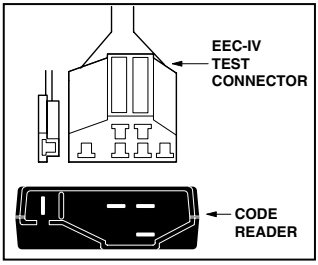
CONNECTING THE TOOL

The Tool's Ford Connector Cable Adaptor is designed to match the vehicle's computer DLC. When properly connected, the vehicle's DLC should match the pre-molded guides around the adaptor. Make sure the adaptor and the vehicle's DLC mate properly before applying force. Forcing the adaptor onto the DLC improperly may result in damage to the adaptor and/or Tool, and possible damage to the vehicle's computer system.

- Connect the Tool to BOTH.

1. large, six pin female connector with molded housing

2. small, single pin female connector



1988 and newer vehicles may have more than one similar connector for other systems (i.e. Anti-Lock Brakes). Only the connector with an extra single pin is the correct test connector for computer service codes use. If you have any questions about the correct connector, please refer to your vehicle's service manual for detailed information.

DIAGNOSTIC TROUBLE CODES (DTCs)

Diagnostic Trouble Codes, or Fault Codes, can be used to identify engine systems or components that are malfunctioning. The computer records codes for two types of problems:

- **"Hard" Diagnostic Trouble Codes**

  "Hard" DTCs represent problems which are happening now and cause the instrument panel Malfunction Indicator Lamp (MIL) or Check engine light to illuminate and remain on until the failure is repaired. A DTC is stored in the vehicle's computer memory for each fault detected. A Tool or Scanner can be used to retrieve DTCs that are stored in the vehicle's computer memory.

- **Intermittent/History DTCs**

  Intermittent/History DTCs are stored in the computer's memory for problems that occur intermittently, or for problems that happened in the past but are not currently present. Intermittent DTCs may cause the Malfunction Indicator light to flicker or stay on until the intermittent malfunction goes away. However, the corresponding

fault code will be stored in memory as a history DTC. If the malfunction that caused the history DTC to set does not recur within a predetermined length of time (usually within 40-80 ignition key start cycles), the computer will automatically erase the related fault code from its memory.

CODE RETRIEVAL PROCEDURES

Overview of Ford Code Retrieval Process

Ford's computer self-diagnostic system is divided into four main sections:

1. "Key On Engine Off" (KOEO) Self-Test
2. "Continuous Memory" (CM) Self-Test
3. "Key On Engine Running" (KOER) Self-Test
4. Other EEC-IV System tests

These Self-Tests are specially designed to monitor and/or test the various components and circuits that are controlled by the vehicle's computer, and to save and/or transmit diagnostic test results to the Tool in the form of numerical fault codes.

The "Continuous Memory" Self-Test is designed to run continuously whenever the vehicle is normal operation. If a fault is detected by the "Continuous Memory" Self-Test, a fault code is saved in the vehicle's computer memory for later retrieval.

Ford's On-Board Diagnostic Self-Tests are designed in such a way that in order to properly diagnose a problem, you must perform all the Self-Tests, in the proper sequence.

As described previously, some tests are designed to detect problems only when the vehicle is in normal operation. Some tests are designed to activate components and detect problems only with the Key On and Engine Off. Other tests are designed to activate components and test their operation only with the Key On and Engine Running. Do not take short cuts. If you fail to perform a test, or you perform a test out of sequence, you might miss a problem that is only detected during that part of the test.

Key On Engine Off (KOEO) Test

During the KOEO Self-Test, two groups of codes are retrieved by the Tool.

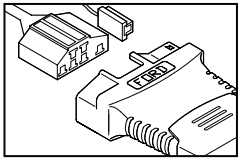
- *The first group of codes retrieved by the Tool are called "KOEO codes". A "KOEO" icon will show in the upper right corner of the LCD display to indicate that the code retrieved is a "KOEO" code.*
- The second group of codes are called "Continuous Memory" codes. A "CM" icon will show in the upper right corner of the LCD display to indicate that the code retrieved is a "Continuous Memory" code.

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

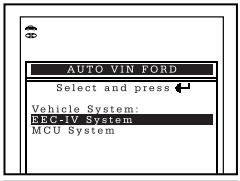
1. Locate the vehicle's Data Link Connector (DLC). See TEST CONNECTORS on page 92 for connector location.

Some DLCs have a plastic cover that must be removed before connecting the Tool's cable connector.



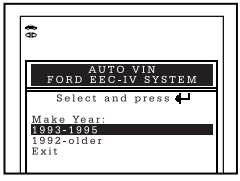
2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ ⊲⊳ button to turn the Tool ON.

- The Select Vehicle System screen displays.



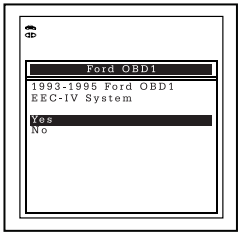
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.

- The Select Model Year screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.

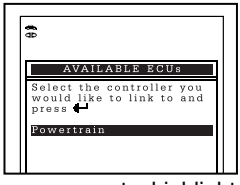
- If **1993-1995** is selected, the Confirm EEC-IV System screen displays



5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.

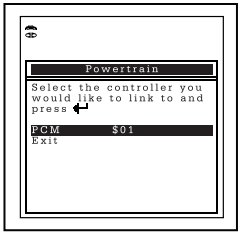
The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.

- The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.

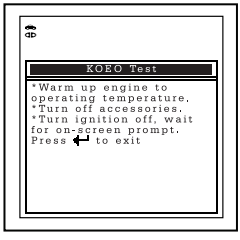


6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.

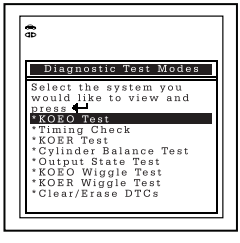
- The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.



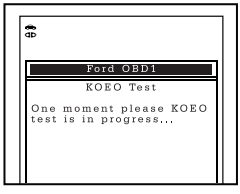
7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.
   - The Ford OBD1 Menu displays.
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **KOEO Test**, then press the **ENTER** ↵ button.
   - The LCD display shows instructions to prepare the vehicle for the KOEO Test.
9. Start and warm-up engine to normal operating temperature. Turn off all vehicle accessories. Press the **ENTER** ↵ button to continue.
10. Turn ignition key OFF and wait for the on screen prompt. If you wish to exit the KOEO test at this time, press the **ENTER** ↵ button.


KOEO Test
*Warm up engine to operating temperature.
*Turn off accessories.
*Turn ignition off, wait for on-screen prompt.
Press ↵ to exit

11. When prompted, turn the ignition ON. DO NOT start the engine. If your vehicle is equipped with one of the following engine types, perform the added procedures described below:
    - **For 4.9L engines with standard transmission:** Press and hold the clutch until all codes are sent (steps 11 through 13).
    - **For 7.3L diesel engines:** Press and hold accelerator until all codes are sent (steps 11 through 13).
    - **For 2.3L turbo engines with octane switch:** Put switch in premium position.



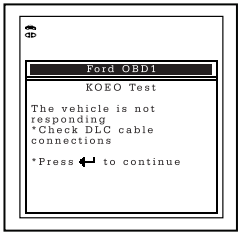
12. Press the **ENTER** ↵ button to continue.
13. While codes are being retrieved, a "One moment please KOEO test is in progress..." message shows on the Tool's LCD display.



As soon as the ignition is turned "on", the vehicle's computer enters the Self-Test mode. Clicking sounds will be heard coming from the engine. This is normal. It indicates that the vehicle's computer is activating relays, solenoids, and other components to check their operation.

WARNING: On some vehicles equipped with an Electric Cooling Fan, the computer activates the cooling fan to check its operation. To avoid injury, keep hands or any part of your body a safe distance from the engine during this test.

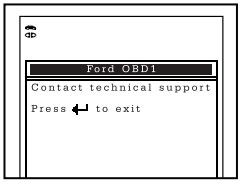
- If the Tool fails to link to the vehicle's computer, a "Vehicle is not responding" message shows on the Tool's LCD display. Do the following:



  - Verify the ignition is ON.
  - Check the cable connections at the Tool and at the vehicle's DLC.
  - Turn the ignition OFF, wait 10 seconds, then turn back ON to reset the computer.

BE SURE to perform the added procedures in step 6, if appropriate for your vehicle, BEFORE turning the ignition ON.

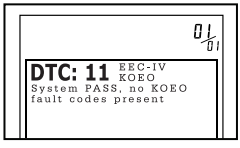
  - Press **ENTER** ↵ button to continue.

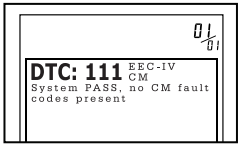


- If the Scan Tool **cannot** link to the vehicle's computer, the message "Contact Technical Support" displays.
  - Press The **ENTER** ↵ button to return to the Ford OBD1 Menu.
  - Turn the ignition off, and disconnect the Scan Tool.
  - Contact Technical Support for assistance.

14. If the Tool was able to link to the vehicle successfully a "Code retrieval was successful..." message shows temporarily on the Tool's LCD display followed by any retrieved DTCs.

- The Tool will display a code only if codes are present in the vehicle's computer memory.
- If no problems are found during the KOEO Self-Test, the computer sends a "PASS" code (code 11 or 111) to the Tool.
- If no Continuous Memory codes are present in the vehicle's computer memory, the Tool will display a "PASS" code (code 11 or 111).





Most Ford EEC-IV vehicle computers up to 1991 use a two-digit code system. From 1991 to 1995 most use a three digit code system.

15. If more than one code was retrieved, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional codes.

16. Disconnect the Tool from the vehicle and turn the ignition key OFF.

17. To prolong battery life, the Tool automatically shuts "Off" after approximately three minutes of no button activity. The DTCs retrieved will remain in the Tool's memory, and may be viewed at any time. If the Tool's batteries are removed, or if the Tool is re-linked to a vehicle to retrieve codes, any prior codes in its memory are automatically cleared.

18. Follow the testing and repair procedures outlined in the vehicle's service repair manual to correct "hard" DTCs. Codes should be addressed and eliminated in the order they were received, erasing (see ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 115) and retesting after each repair is done to be sure the fault was eliminated.

IMPORTANT: *DO NOT service "Continuous Memory" codes at this time. Before "Continuous Memory" codes can be serviced, both the KOEO and the KOER Self-Tests must pass (a PASS code 11 or 111 is obtained). After both of these tests have passed, erase the vehicle's computer memory (see ERASING ENHANCED DATA on page 87), take the vehicle for a short drive, then repeat the KOEO Self-Test. If any Continuous Memory faults are present, service them all this time. Consult the vehicle's service repair manual for servicing Continuous Memory Fault Codes.*

Do not proceed to the ignition timing check procedure or the KOER test until a PASS code (code 11 or 111) for KOEO test is obtained.

Engine Timing Check

Before performing the KOER Self-Test, the vehicle's Ignition Base Timing and the computer's ability to electronically control timing advance must be checked for proper operation. Maladjustment of ignition timing, or a problem in the advance circuit, might generate false fault codes when performing the KOER Self-Test that would cause the test to be invalid. Use the following procedures to check for proper ignition timing and to verify the computer's ability to electronically advance ignition timing.

The following "Timing Check" procedure is only applicable to 1992 and older vehicles (excluding diesel engines). For 1993 and newer vehicles, refer to the vehicle's service repair manual for procedures to check and adjust timing. DO NOT ATTEMPT TO ADJUST TIMING ON THESE VEHICLES WITHOUT MANUFACTURER'S SPECIFICATIONS AND PROCEDURES.

For 1992 and older vehicles, the Tool can be used in combination with a timing light to check ignition timing and the vehicle computers ability to advance ignition timing.

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

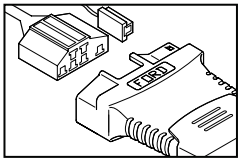
***ALWAYS** observe safety precautions whenever working on a vehicle. Read and follow Safety Precautions on page 1 before performing this test.*

- A timing light is required to perform this test.
- The vehicle must pass the KOEO Test (page 94) before performing this test.

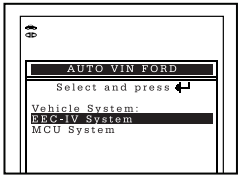
1. Locate the vehicle's Data Link Connector (DLC). See TEST CONNECTORS on page 92 for connector location.

Some DLCs have a plastic cover that must be removed before connecting the Tool's cable connector.

2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** button to turn the Tool ON, then press **ENTER** ↵ button to continue.

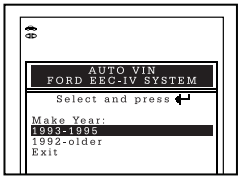


- The Select Vehicle System screen displays.



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.

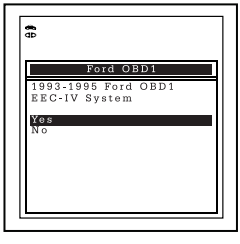
- The Select Model Year screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.

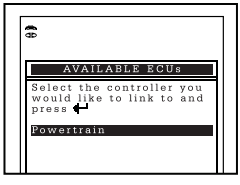
- If **1993-1995** is selected, the Confirm EEC-IV System screen displays

5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.



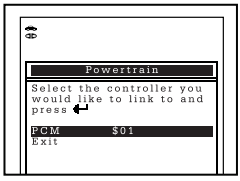
The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.

- The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.



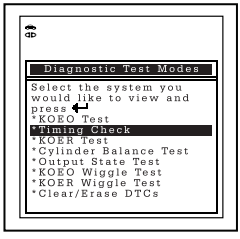
6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.

- The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.



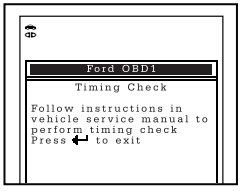
7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.

- The Ford OBD1 Menu displays.

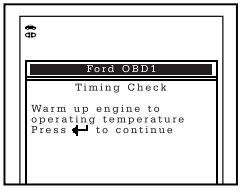


8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Engine Timing Check**, then press the **ENTER** ↵ button.

- **For 1993 and newer vehicles:** The message "Follow instructions in vehicle service manual to perform timing check" displays. Press the **ENTER** ↵ button to exit. Refer to the vehicle's service manual for timing check procedures.
- **For 1992 and older vehicles:** The message "Warm up engine to operating temperature" displays



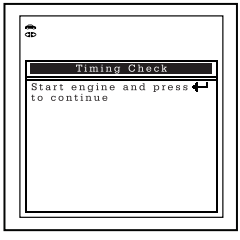
9. Start and warm-up engine to normal operating temperature. Press the **ENTER** ↵ button to continue.



10. When prompted, turn off all vehicle accessories, turn ignition key OFF and wait for the on screen prompt. If you wish to exit the Timing Check procedure at this time, press the **ENTER** ↵ button.

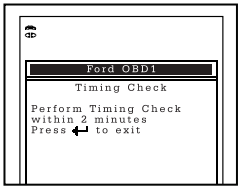
11. When instructed by the message on the Tool's display, start the engine and press the **ENTER** ↵ button.

- A "One moment please preparation for test is in progress" message shows temporarily on the Tool's LCD display, followed by the message "Perform Timing Check within two minutes."



- When "Perform Timing Check within 2 minutes" displays, perform the Timing Check as follows:

- The vehicle's computer is programmed to advance ignition timing 20° (±3°) above the vehicle's "base timing" value, and to freeze this setting for two minutes from the time the "Perform Timing Check within 2 minutes" message displays. This allows the user to check the computer's ability to advance ignition timing.



- Within this two-minute period, follow instructions in the vehicle's service repair manual to check the ignition timing with a timing light and ensure that it is 20° above the specified base timing value (±3°).

Example: If base timing specification is 10° BTDC, the acceptable timing light reading should be in the range of 27° to 33° BTDC.

Base-timing specifications can be found on the Vehicle Emission Control Information (VECI) decal. The decal is located under the hood or near the radiator. If the VECI decal is missing or damaged, refer to your vehicle's service repair manual for specifications.

12. If timing light readings are within the acceptable range:

- Base timing and the vehicle computer's ability to advance timing are working properly.
- Proceed to the KOER Self-Test below.

13. If timing light readings are not within the acceptable range:

- Base timing may be out of adjustment, or the computer may have problems with the timing advance circuit.
- Refer to the vehicle's service repair manual for procedures on adjusting and/or repairing ignition timing. Repairs to ignition timing must be made before proceeding to the KOER Test.

Key on Engine Running (KOER) Self-Test

IMPORTANT: *The KOEO Self-Test (page 94) must be performed first, and a "pass code" (code 11 or 111) must be obtained before performing the KOER Self-Test; otherwise, results of the KOER Self-Test may be invalid.*

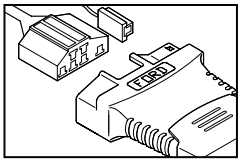
Ignition timing and timing advance must be operating properly in order for the KOER Self-Test results to be considered valid. Perform an Engine Timing check (page 98) before performing the KOER Self-Test.

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

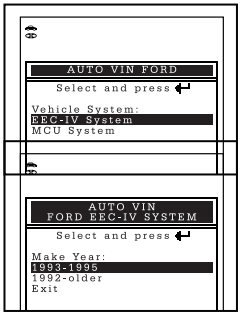
ALWAYS *observe safety precautions whenever working on a vehicle. Read and follow Safety Precautions on page 1 before performing this test.*

1. Locate the vehicle's Data Link Connector (DLC). See TEST CONNECTORS on page 92 for connector location.

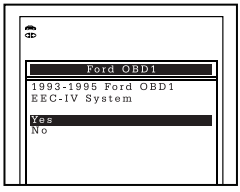
Some DLCs have a plastic cover that must be removed before connecting the Tool cable connector.



2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** button to turn the Tool ON, then press the **ENTER** ↵ button to continue.
   - The Select Vehicle System screen displays.

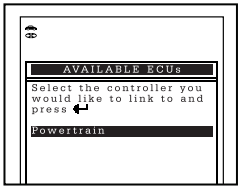


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.
   - The Select Model Year screen displays.
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.
   - If **1993-1995** is selected, the Confirm EEC-IV System screen displays

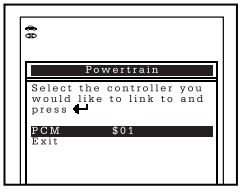


5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.

The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.



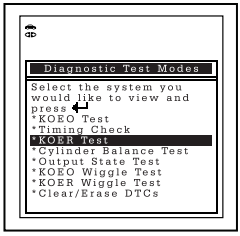
   - The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.
6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.
   - The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.



7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.

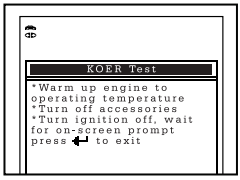
- The Ford OBD1 Menu displays.

8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **KOER Test**, then press the **ENTER** ↵ button.

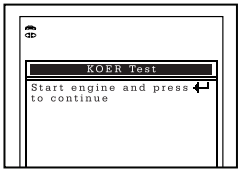


- The message "Make sure ignition timing is within factory specifications" displays. If necessary, press the **DTC** button to exit, and perform an Engine Timing Check (page 98). Otherwise, press the **ENTER** ↵ button to continue.

9. The message "Warm up engine to operating temperature" displays. Start and warm-up engine to normal operating temperature. Turn off all vehicle accessories. Press the **ENTER** ↵ button to continue.

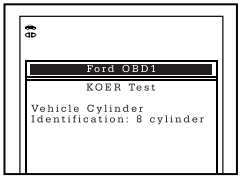

KOER Test
*Warm up engine to operating temperature
*Turn off accessories
*Turn ignition off, wait for on-screen prompt
press ↵ to exit

10. When prompted, turn off all vehicle accessories, turn ignition key OFF and wait for the on screen prompt. If you wish to exit the KOER test at this time, press the **ENTER** ↵ button.



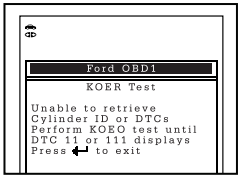
11. When instructed by the message on the Tool's display, start the engine and press the **ENTER** ↵ button to continue. A "One moment please KOER test is in progress..." message shows temporarily on the Tool's LCD display.

12. The Tool will retrieve the Cylinder Identification (ID) Code. The Cylinder ID Code identifies the number of cylinders for the vehicle under test.

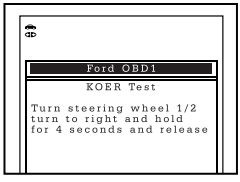


- If the Tool cannot retrieve the Cylinder ID Code, an advisory message displays. Press the **ENTER** ↵ button to exit and repeat the Key On Engine Off (KOEO) test (page 94) until DTC 11 or 111 displays.

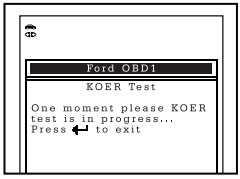
13. Perform the following procedures when prompted by the message on the Tool's display.



- Turn the steering wheel 1/2 turn to right, hold for four seconds and release.
- Press the brake pedal to the floor and then release it.
- Cycle the Overdrive Switch (if equipped).



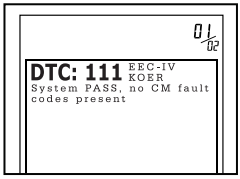
- Quickly press the accelerator pedal to the floor and then release it.



14. After the above procedures are performed a "One moment please KOER test is in progress..." message shows temporarily on the Tool's LCD display, followed by a "Retrieving codes" message.

Most Ford EEC-IV vehicle computers up to 1991 use a two-digit code system. From 1991 to 1995 most use a three-digit code system.

- A "Code retrieval was successful" message displays when KOER codes have been retrieved.



15. If no problems are found during the KOER Self-Test, the computer sends a "PASS code" (code 11 or 111) to the Tool. Code 11 or 111 indicates that all the relays and actuators and their related circuits that were tested during the KOER Self-Test are OK, and no faults were found.

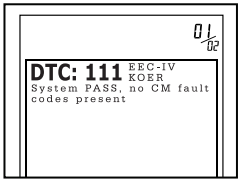
16. After the Tool retrieves all the KOER Self-Test DTCs, turn the engine off, and disconnect the Tool from the vehicle's test connectors. The DTCs retrieved are now stored in the Tool's memory.

All retrieved DTCs will remain in the Tool's memory. If the KOER Test procedure is performed again, DTC's from a prior test will automatically clear and will be replaced by the most current DTCs retrieved.

17. All KOER codes that are retrieved by the Tool during the KOER Self-Test represent problems that are present now (at the time the test is performed). The related vehicle problems that caused the codes to be sent must be repaired using the procedures described in the vehicle's repair manual.

18. After all repairs have been completed, repeat the KOER Self-Test.

19. If a "pass code" (code 11 or 111) is received, it indicates that the repairs were successful and all the related systems are working properly.



20. If a "pass code" (code 111 or 111) is not received, the repair was unsuccessful. Consult the vehicle's service manual and recheck repair procedure.

ADDITIONAL TESTS FOR EEC-IV SYSTEMS

These tests are additional, supplemental tests, and are not needed to retrieve Diagnostic Trouble Codes. Ford has included them to further assist the technician / do-it-yourselfer in the troubleshooting of vehicle problems.

Cylinder Balance Test (Vehicles equipped with Sequential Electronic Fuel Injected (SEFI) systems only)

The Cylinder Balance Test assists in finding a weak or noncontributing cylinder. The computer shuts off fuel (cuts off power to injectors) to each cylinder, in sequence, and monitors for RPM changes (drop). Based on this information, the computer determines if all the cylinders are contributing power equally (for proper engine operation), or if some cylinders are only contributing partially or not contributing at all.

SEFI Introduction

Sequential Electronic Fuel Injection (SEFI) belongs to a family of fuel injection systems called "Multi-port/Multipoint Fuel Injection". Multi-port (MFI) fuel injection systems contain one fuel injector per cylinder, and the vehicle's computer electronically controls their operation. On some multi-port fuel injection systems, the injectors all fire at the same time and at every engine revolution. On other systems the injectors fire in groups and/or at every other engine revolution. What distinguishes Sequential Electronic Fuel Injection systems from other multi-port fuel injection systems is that each injector is independently energized and fires sequentially one after the other in the proper firing order. This gives the vehicle's computer more control to cut the fuel to one injector at a time (this can't be accomplished on the other systems because they fire in groups of two ore more injectors).

Cylinder Balance Test Procedure

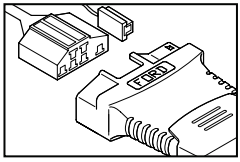
Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

ALWAYS observe safety precautions whenever working on a vehicle. Read and follow Safety Precautions on page 1 before performing this test.

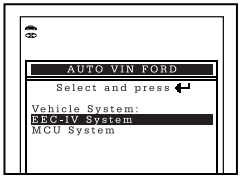
1. Locate the vehicle's Data Link Connector (DLC). See TEST CONNECTORS on page 92 for connector location.

Some DLCs have a plastic cover that must be removed before connecting the Tool cable connector.

2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ button to turn the Tool ON, then press the **ENTER** ↵ button to continue.

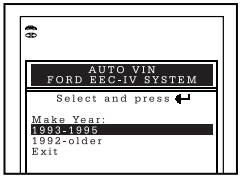


- The Select Vehicle System screen displays.



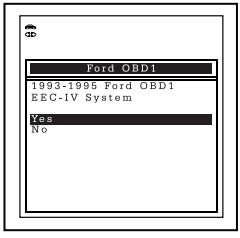
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.

- The Select Model Year screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.

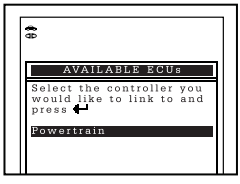
- If **1993-1995** is selected, the Confirm EEC-IV System screen displays



5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.

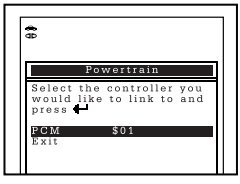
The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.

- The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.



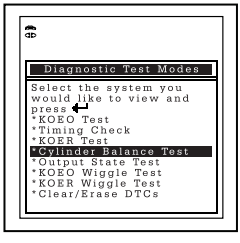
6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.

- The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.



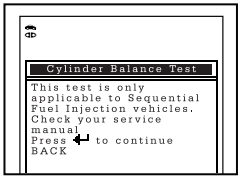
7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.

- The Ford OBD1 Menu displays.

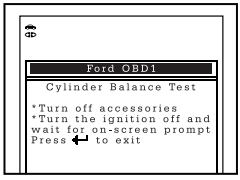


8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Cylinder Balance Test**, then press the **ENTER** ↵ button.

- An advisory message displays. If the vehicle **is not** equipped with Sequential Electronic Fuel Injection (SEFI), use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight BACK, then press the **ENTER** ↵ button. Otherwise, press the **ENTER** ↵ button to continue.

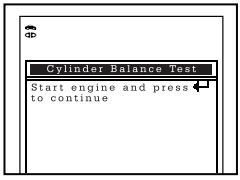

Cylinder Balance Test
This test is only applicable to Sequential Fuel Injection vehicles. Check your service manual
Press ↵ to continue
BACK

9. When prompted, start and warm-up engine to normal operating temperature. Press the **ENTER** ↵ button to continue.



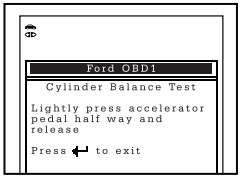
10. When prompted, turn off all vehicle accessories, turn ignition key OFF and wait for the on screen prompt. If you wish to exit the Cylinder Balance test at this time, press the **ENTER** ↵ button.

11. When instructed by the message on the Tool's display, start the engine and press the **ENTER** ↵ button.



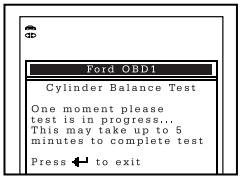
- A "One moment please preparation for test is in progress..." message shows temporarily on the Tool's LCD display.

12. When prompted by the message on the Tool's display, lightly press the accelerator pedal half way and release to activate the cylinder balance test.



For 1986 models ONLY: *Fully press accelerator once and release.*

- The computer is now in Cylinder Balance Test mode, and will start cutting fuel to each cylinder in sequence to determine if all the cylinders are contributing equally. **It may take up to five minutes before the test results are transmitted to the Tool.**


Ford OBD1
Cylinder Balance Test
One moment please test is in progress... This may take up to 5 minutes to complete test
Press ↵ to exit

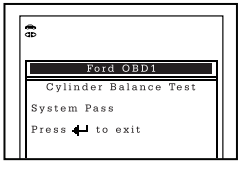
13. If the vehicle's computer fails to enter Cylinder Balance Test mode, do the following:

- Lightly press the accelerator pedal again as described in step 11 above.

14. After the Cylinder Balance Test is completed, the test results are sent to the Tool.

- The computer compares the power contribution that each cylinder makes to engine operation.

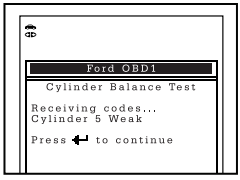
15. If all cylinders are contributing equally, the computer determines that power distribution is normal and a “System Pass” message will display.



If the computer detects a problem with a cylinder(s) when performing the initial Cylinder Balance Test, it needs to repeat the test two more times to properly determine which cylinder or cylinders are malfunctioning. If this is the case, the Tool will display the "Lightly press the accelerator half way and release" message again instead of the "System Pass". Proceed to step 11.

16. If a cylinder is not contributing at the same level as the other cylinders, the computer prompts you to repeat the test two more times by displaying the "Lightly press the accelerator half way and release" message again. Each time the message displays, perform the procedures as instructed.

17. After the repeat Cylinder Balance tests have completed, the computer will identify which cylinder (or cylinders) are not contributing equally, and will send this information to the Tool's LCD display.



- If any weak cylinders are identified, consult the vehicle's service repair manual to perform further testing and/or repairs.

Relay and Solenoid Test (Output State Check)

The "Output State Check" is a special program in the vehicle's computer that allows the user to energize (turn ON) and de-energize (turn OFF), on command, most of the actuators (relays and solenoids) that are controlled by the computer.

Use this test to check computer output voltages and relay/solenoid operation.

The fuel injectors and fuel pump are not energized during this test. Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

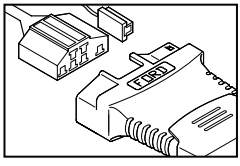
***ALWAYS** observe safety precautions whenever working on a vehicle.*

Read and follow Safety Precautions on page 1 before performing this test.

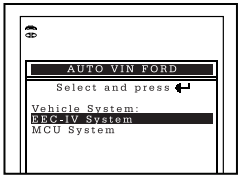
1. Locate the vehicle's Data Link Connector (DLC). See TEST CONNECTORS on page 92 for connector location.

Some DLCS have a plastic cover that must be removed before connecting the Tool cable connector.

2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ button to turn the Tool ON, then press the **ENTER** ↵ button to continue.

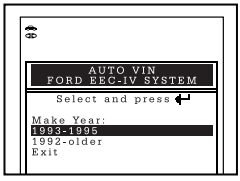


- The Select Vehicle System screen displays.



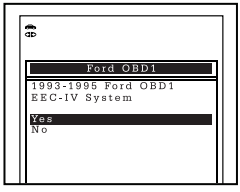
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.

- The Select Model Year screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.

- If **1993-1995** is selected, the Confirm EEC-IV System screen displays



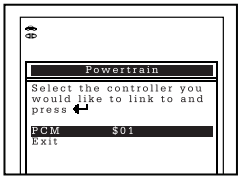
5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.

The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.

- The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.

6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.

- The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.

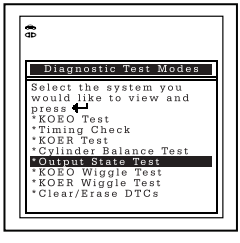


7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.

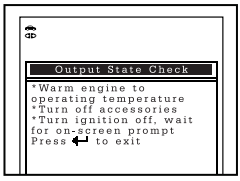
- The Ford OBD1 Menu displays.

8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Output State Check**, then press the **ENTER** ↵ button.

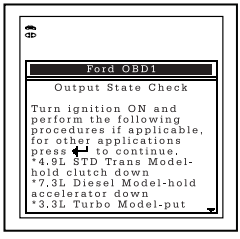
9. The message “Warm up engine to operating temperature” displays. Start and warm-up engine to normal operating temperature. Press the **ENTER** ↵ button to continue.



10. When prompted, turn ignition key OFF and wait for the on screen prompt. If you wish to exit the Output State Check at this time, press the **ENTER** ↵ button.


Output State Check
*Warm engine to operating temperature
*Turn off accessories
*Turn ignition off, wait for on-screen prompt
Press ↵ to exit

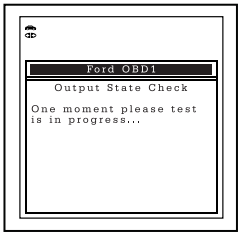
11. When prompted, turn ignition ON. DO NOT start the engine. If your vehicle is equipped with one of the following engine types, perform the added procedures described below:


Ford OBD1
Output State Check
Turn ignition ON and perform the following procedures if applicable, for other applications press ↵ to continue.
*4.9L STD Trans Model-hold clutch down
*7.3L Diesel Model-hold accelerator down
*3.3L Turbo Model-put

- **For 4.9L engines with standard transmission:** Press and hold the clutch until the "Output State Check Active" screen displays.
- **For 7.3L diesel engines:** Press and hold accelerator until the "Output State Check Active" screen displays
- **For 2.3L turbo engines with octane switch:** Put switch in premium position.

12. Press the **ENTER** ↵ button to continue.

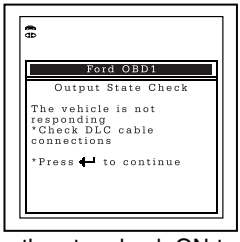
13. A "One moment please test is in progress..." message shows on the Tool's LCD display.



As soon as the ignition is turned "on", the vehicle's computer enters the Self-Test mode. Clicking sounds will be heard coming from the engine. This is normal.

WARNING: On some vehicles equipped with an Electric Cooling Fan, the computer activates the cooling fan to check its operation. To avoid injury, keep hands or any part of your body a safe distance from engine during the test.

- If the Tool fails to link to the vehicle's computer, a “Vehicle is not responding” message shows on the Tool’s LCD display. Do the following:

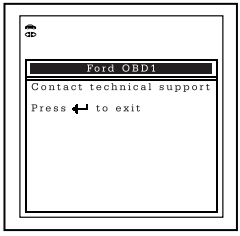


  - Verify the ignition is ON.
  - Check the cable connections at the Code Reader and at the vehicle’s DLC.
  - Turn the ignition OFF, wait 10 seconds, then turn back ON to reset the computer.

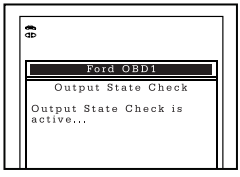
BE SURE to perform the added procedures in step 6, if appropriate for your vehicle, BEFORE turning the ignition ON.

  - Press the **ENTER** ↵ button to continue.

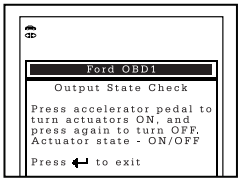
- If the Scan Tool **cannot** link to the vehicle's computer, the message "Contact Technical Support" displays.
  - Press the **ENTER** ↵ button to return to the Ford OBD1 Menu.
  - Turn the ignition OFF, and disconnect the Scan Tool.
  - Contact Technical Support for assistance.



14. If the Tool was able to link to the vehicle successfully an "Output State check is active..." message shows temporarily on the Tool's LCD display. This message is followed by a display that instructs you how to perform the test.



15. When prompted, press the accelerator pedal once, then release. This activates the Output State Check and energizes most of the actuators (relays and solenoids) that are controlled by the vehicle's computer.


Ford OBD1
Output State Check
Press accelerator pedal to turn actuators ON, and press again to turn OFF.
Actuator state - ON/OFF
Press ↵ to exit

If your vehicle is equipped with an Integrated Vehicle Speed Control, disconnect the vacuum supply hose from the speed control servo before pressing the accelerator. Reconnect vacuum hose after test.

16. To de-energize the actuators, press the accelerator pedal again and release, the actuators are now de-energized.

17. The procedure can be repeated as many times as desired by pressing and releasing the accelerator pedal to energize and de-energize the actuators.

18. Consult the vehicle's service repair manual for a list of actuators (solenoids and relays) controlled by the computer that apply to the vehicle under test, and which actuators should energize and de-energize when performing the Output State Check. All applicable actuators should be on when energized and off when de-energized.

19. If an actuator is not responding to the Output State Check, follow the procedures described in the vehicle's service manual to check computer actuator output circuit voltages and/or grounds.

20. The Output State Check will stay active as long as desired. To quit the Output State Check, turn the ignition OFF and disconnect the Tool from the vehicle.

Wiggle Test

Since any DTC's from Wiggle Test results are saved in Continuous Memory, it is suggested that you clear any DTC's in Continuous Memory before performing Wiggle Test (see SERVICING DTCs on page 116 for procedures). This way you start with a clean slate, and any faults detected during the procedure will be related to that particular circuit tested.

Use this test to check for intermittent faults in some circuits.

Circuits Tested:

1984 & Newer - Air Charge Temp Sensor (ACT), Barometer Pressure Sensor (BP), Engine Coolant Temp Sensor (ECT), Exhaust Gas Oxygen Sensor (EGO), EGR Valve Position Sensor (EVP), Manifold Absolute Pressure (MAP), Throttle Position Sensor (TP), Vane Air Temp Sensor (VAT)

1985 & Newer - Vane Air Flow Sensor (VAF)

1986 & Newer - Pressure Feedback EGR Sensor (PFE)

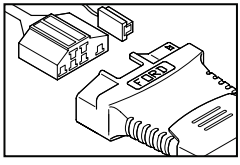
1990 & Newer - Exhaust Gas Oxygen Sensor (EGO), Ignition Diagnostic Monitor (IDM) (DIS or Dual Plug DIS only), Idle Tracking Switch (ITS), Mass Air Flow Sensor (MAF)

***ALWAYS** observe safety precautions whenever working on a vehicle. Read and follow Safety Precautions on page 1 before performing this test.*

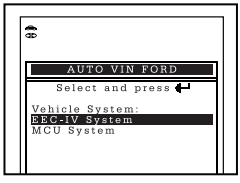
1. Locate the vehicle's Data Link Connector (DLC). TEST CONNECTORS on page 92 for connector location.

Some DLCs have a plastic cover that must be removed before connecting the Tool cable connector.

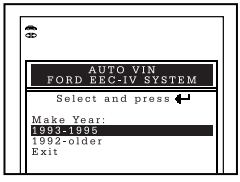
2. Connect the Tool cable (with the Ford Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ button to turn the Tool ON, then press the **ENTER** ↵ button to continue.



   - The Select Vehicle System screen displays.

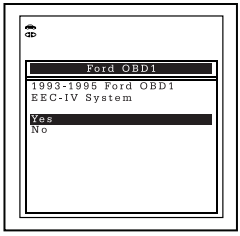


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the appropriate vehicle system, then press the **ENTER** ↵ button.
   - The Select Model Year screen displays.



4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the vehicle model year, then press the **ENTER** ↵ button.

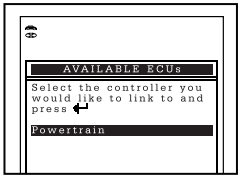
- If **1993-1995** is selected, the Confirm EEC-IV System screen displays



5. If the vehicle under test *is equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button. If the vehicle under test *is not equipped* with an EEC-IV system, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.

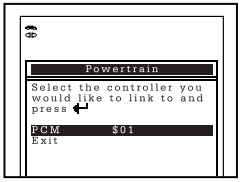
The Scan Tool can retrieve OBD1 DTCs only from vehicles equipped with EEC-IV systems.

- The Available ECUs screen displays. The screen lists all vehicle systems from which you can retrieve data.



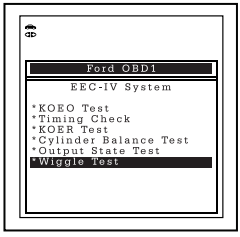
6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button.

- The Select Controller screen displays. The screen lists all available controllers for the selected vehicle system.



7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button.

- The Ford OBD1 Menu displays.



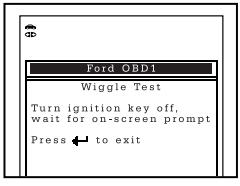
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Wiggle Test**, then press the **ENTER** ↵ button.

9. The message "Warm up engine to operating temperature" displays. Start and warm-up engine to normal operating temperature. Press the **ENTER** ↵ button to continue.

KOEO Wiggle Test
*Warm up engine to operating temperature
*Turn off accessories
*Turn ignition off, wait for on-screen prompt
Press ↵ to exit

10. When prompted, turn ignition key OFF and wait for the on screen prompt. If you wish to exit the KOEO test at this time, press the **ENTER** ↵ button.

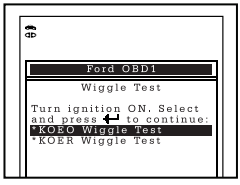
11. Turn the ignition on, then select the desired Wiggle Test from the menu displayed.



- To perform the KOEO Wiggle Test:
  - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **KOEO Wiggle Test**.

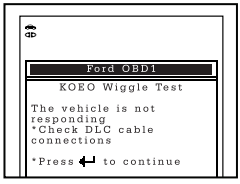
- DO NOT START THE ENGINE.
- Press the **ENTER** ↵ button to continue.

■ To perform the KOER Wiggle Test:



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **KOER Wiggle Test**.
- When prompted, start the engine.
- Press the **ENTER** ↵ button to continue.

12. A "One moment please test is in progress" message shows temporarily on the Tool's LCD display.



■ If the Tool fails to link to the vehicle's computer, a "Vehicle is not responding" message shows on the Tool's LCD display. Do the following:

For KOEO Wiggle Test:

- Verify the ignition is ON.
- Turn the ignition OFF, wait 10 seconds, then turn back ON to reset the computer. Press the **ENTER** ↵ button to continue.

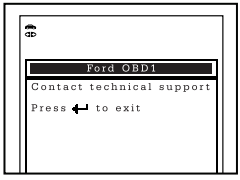
For KOER Wiggle Test:

- Turn the engine OFF, wait 10 seconds, then turn back ON. Press the **ENTER** ↵ button to continue.

BE SURE to perform the added procedures in step 6, if appropriate for your vehicle, BEFORE turning the ignition ON.

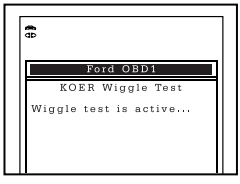
- Press **ENTER** ↵ button to continue.

■ If the Scan Tool **cannot** link to the vehicle's computer, the message "Contact Technical Support" displays.

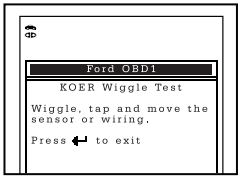


- Press the **ENTER** ↵ button to return to the Ford OBD1 menu.
- Turn the ignition OFF, and disconnect the Scan Tool.
- Contact Technical Support for assistance.

13. If the Tool was able to link to the vehicle successfully, a "Wiggle test is active..." message shows temporarily on the Tool's LCD display. This is followed by a message instructing you how to perform the test.

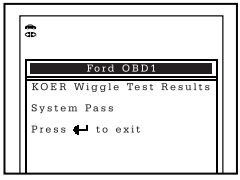


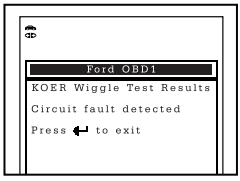
■ Press the **ENTER** ↵ button if you wish to exit the Wiggle Test at this time.



14. Wiggle, tap and move the suspected sensor or wiring.

- If no faults are detected when performing the Wiggle Test, a "System Pass" message displays.
- If a fault is detected when performing the Wiggle Test, a "Circuit Fault detected" message displays.





If the Wiggle Test detects any problems, the related DTC will be stored by the computer in "Continuous Memory". To view any Wiggle Test DTC's you must perform the KOEO Test. See page 94 for KOEO Test procedures.

15. Follow the procedures in the vehicle's service repair manual to perform troubleshooting and repairs for Wiggle Test results.

16. The Wiggle Test will stay active as long as desired. To quit the Wiggle Test, turn the ignition OFF and disconnect the Tool from the vehicle.

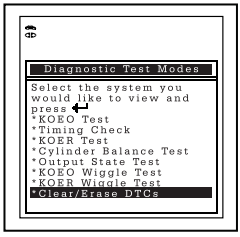
ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)

2. Perform the CODE RETRIEVAL PROCEDURES on page 94 and select the controller from which you wish to erase data from the Available ECUs screen.

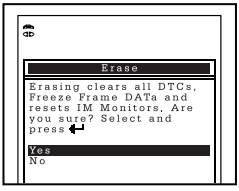
- The DTC Menu screen displays.



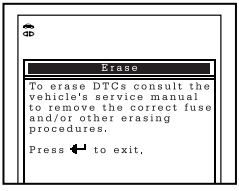
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.

- If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.

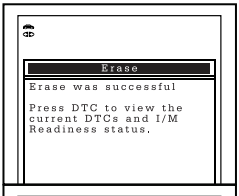
- If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.



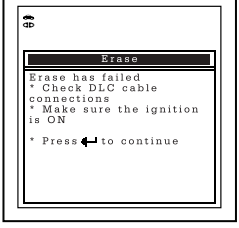
If erasing DTCs using a Scan Tool IS NOT supported by the vehicle, an instructional message displays. Refer to the vehicle's service manual forprocedures to erase DTCs from the vehicle's computer


Erase
To erase DTCs consult the vehicle's service manual to remove the correct fuse and/or other erasing procedures.
Press ↵ to exit.

4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

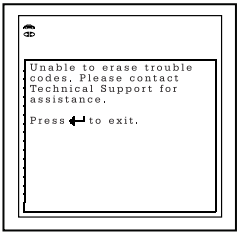


- If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.



- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.

- If the erase process fails continuously, an advisory message displays. Contact Technical Support for assistance.



Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

SERVICING DTCs

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Retrieved information can be uploaded to a Personal Computer (PC) with the use of optional software. For more information, see instructions included with the optional software.

CODE RETRIEVAL PROCEDURE

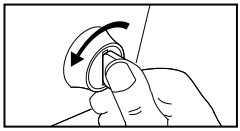
System Selection

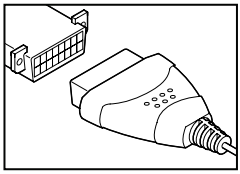
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Check the vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 2 for connector location.





Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.

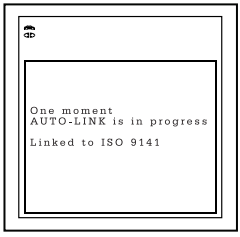
*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*

3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.
   - If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
   - If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, the "To Link" screen displays.

   - If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.
   - If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer

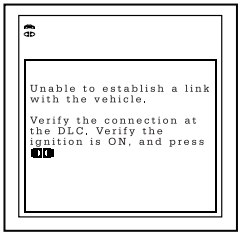
(PCM) fuse/circuit, and perform any necessary repairs before proceeding.

6. Press the **POWER/LINK** button. The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.



A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

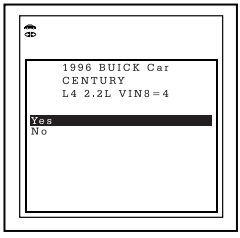
- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.



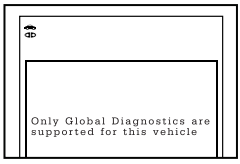
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

7. Once the vehicle's communication protocol has been determined, the Scan Tool performs a "VIN check" to identify the vehicle.

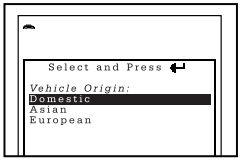
- If the Scan Tool is able to identify the vehicle, the Confirm Vehicle screen displays.
- If the correct vehicle is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.

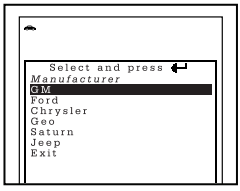


- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 13 to select the type of data you wish to view.
- If enhanced diagnostics *are not supported* by the vehicle, an advisory message shows momentarily on the Scan Tools display.



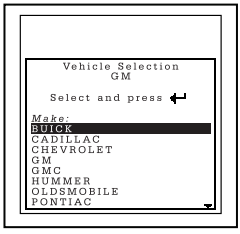
- If the correct vehicle *is not* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.
  - The Select Vehicle Origin screen displays.





8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired country of origin, then press the **ENTER** ↵ button.

- The Select Manufacturer screen displays

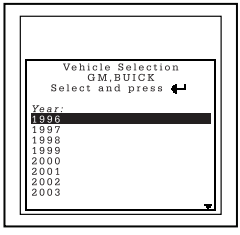


9. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **GM**, then press the **ENTER** ↵ button.

- The Select Make screen displays.

10. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

- The Select Model Year screen displays,

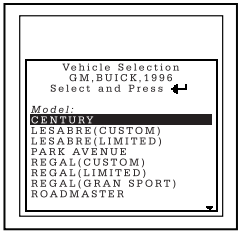


11. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.

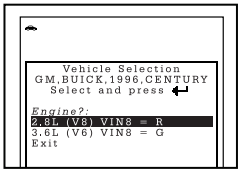
- The Select Model screen displays.

12. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.

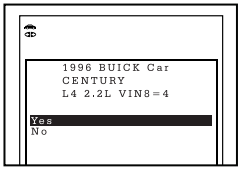
- The Enter 8th Digit of VIN screen displays.



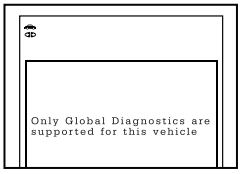
13. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the 8th digit of the vehicle's VIN, then press the **ENTER** ↵ button to continue.



- The Confirm Vehicle screen displays.
- If the correct vehicle *is* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.

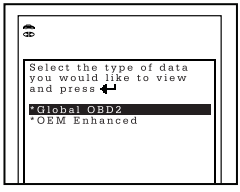


- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.
- If enhanced diagnostics *are not* supported by the vehicle, an advisory message shows momentarily on the Scan Tools display. Proceed to step 15 to view global DTCs.
- If the correct vehicle is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Manufacturer screen and re-enter the appropriate vehicle information.

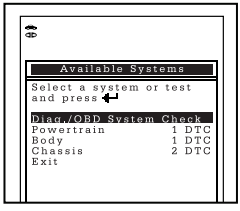


14. If the vehicle supports both Global and enhanced diagnostics, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OEM Enhanced**, then press the **ENTER** ↵ button.

You can return to the Select Data Type screen at any time to revise you selection (as long as the Scan Tool is connected to the vehicle) by pressing ***POWER/LINK*** ⏻ *button.*

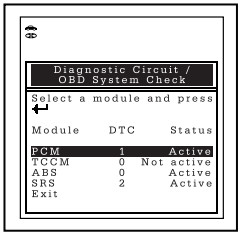


15. When **OEM Enhanced** is chosen from the Select Data Type screen, the Available Systems screen displays. The screen lists all systems from which you can retrieve data, and shows the current number of DTCs stored for each system.



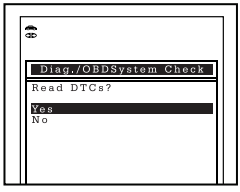
- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button to continue.
- If **Diag./OBD System Check** is selected, refer to Diagnostic/OBD System Check on page 122 to continue.
- If **Powertrain** is selected, refer to Retrieving Powertrain Enhanced Data on page 122 to continue.

- If **Body** is selected, refer to Retrieving Body Enhanced Data on page 124 to continue.
- If **Chassis** is selected, refer to Retrieving Chassis Enhanced Data on page 125 to continue.

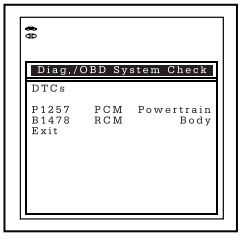


Diagnostic/OBD System Check

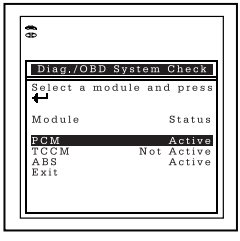
1. When **Diag./OBD System Check** is selected from the Available Systems screen, the Diagnostic/OBD System Check screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired option, then press the **ENTER** ↵ button.



2. If **Yes** is selected, the Vehicle Module Scan Test DTCs screen displays. The screen shows a listing of DTCs stored in all available systems.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the Available Systems screen.

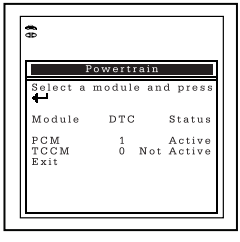


3. If **No** is selected, the Vehicle Module Scan Test Status screen displays. The screen shows the current status for each available system.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Exit**, then press the **ENTER** ↵ button to return to the Available Systems screen.



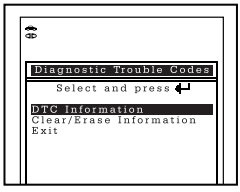
Retrieving Powertrain Enhanced Data

1. When **Powertrain** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** ↵ button.

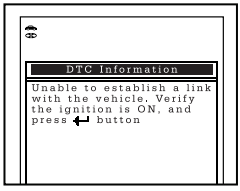


2. The Diagnostic Trouble Codes menu displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **DTC Information**, then press the **ENTER** ↵ button.

- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.



  - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 more information).



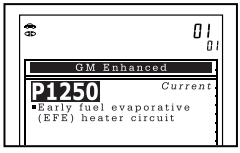
3. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.

4. To read the display:

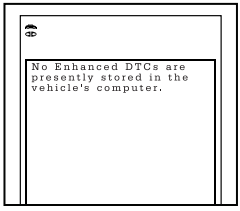
Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the GM Enhanced menu.



- Press the **DTC** button to return to the previous menu.

5. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 126 for details).

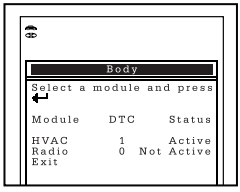
6. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 127 for details).

7. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 128 for details).

8. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen.

Retrieving Body Enhanced Data

1. When **Body** is selected from the Available Systems screen, the Available Modules screen displays.

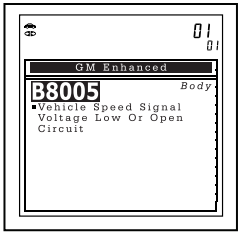


   - Use the **UP** and **DOWN** buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** button.

2. The Diagnostic Trouble Codes menu displays.

   - Use the **UP** and **DOWN** buttons, as necessary, to highlight **DTC Information**, then press the **ENTER** button.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** button to continue. The Scan Tool returns to the Available Modules screen.

3. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
4. To read the display:

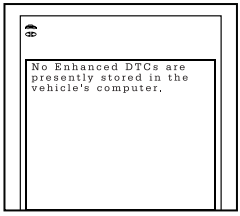


Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

   - A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
   - The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
   - The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.
   - Use the **UP** and **DOWN** buttons, as necessary, to view the entire list.

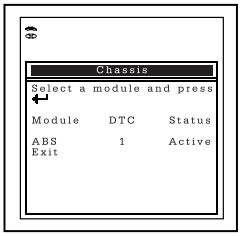
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the GM Enhanced menu.



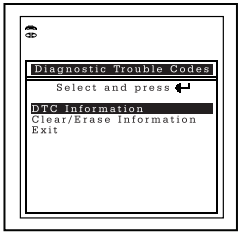
- When you have scrolled through all retrieved DTCs, the Scan Tool returns to the GM Enhanced menu.

5. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 126 for details).
6. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 127 for details).
7. If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 128 for details).
8. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen.

Retrieving Chassis Enhanced Data



1. When **Chassis** is selected from the Available Systems screen, the Available Modules screen displays.
   - Use the **UP** and **DOWN** buttons, as necessary, to highlight the module from which you wish to retrieve data, then press the **ENTER** button.
2. The Diagnostic Trouble Codes menu displays.

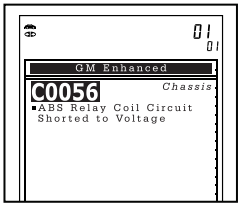


   - Use the **UP** and **DOWN** buttons, as necessary, to highlight **DTC Information**, then press the **ENTER** button.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** button to continue. The Scan Tool returns to the Available Modules screen.
3. A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
4. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.



- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the GM Enhanced menu.

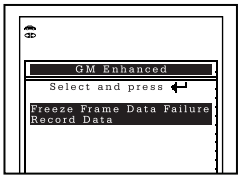
- When you have scrolled through all retrieved DTCs, the Scan Tool returns to the GM Enhanced menu.
- If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 126 for details).
- If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 127 for details).
- If desired, press the **SYSTEM TEST** button to view system test results (see SYSTEM TEST on page 128 for details).
- To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Available Modules screen.

VIEWING FREEZE FRAME DATA

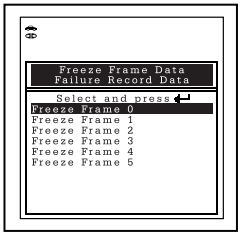
In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data.

When viewing GM "enhanced" powertrain DTCs, you may also view "enhanced" Freeze Frame data. The vehicle's computer may store multiple Freeze Frames.

1. While viewing GM "enhanced" Powertrain DTCs, press the **FF** button.
   - The Freeze Frame menu displays.



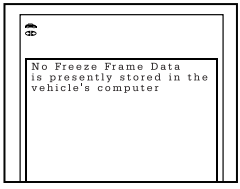
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the type of data you wish to view, then press the **ENTER** ↵ button.
   - If a single Freeze Frame has been saved, the Freeze Frame screen displays.
   - If more than one Freeze Frame has been saved, a Freeze Frame menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the Freeze Frame you wish to view, then press the **ENTER** ↵ button.



The options available through the Freeze Frame menu differ depending on the vehicle's communication protocol.

3. Saved engine conditions may include but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate and intake manifold pressure.
4. If more than one Freeze Frame was saved, press the **FF** button to return to the Freeze Frame menu to select another Freeze Frame for viewing.

*If no Freeze Frame data is present, the message "No Freeze Frame Data is presently stored in the vehicle's computer" displays. Press the **POWER/LINK** ⏻ button to return to the Available Modules screen.*



VIEWING LIVE DATA

The OBD2 Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

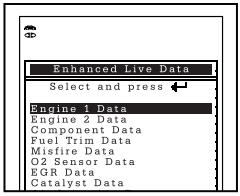
In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Enhanced Live Data screen displays.



2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the type of data you wish to view, then press the **ENTER** ↵ button.

The available options depend on the communication protocol used by the vehicle under test.

   - The Live Data screen displays.

3. Real-time Live Data (PID) information supported by the vehicle under test displays.

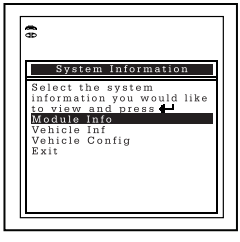
Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

   - A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.
   - If desired, press and release the **LD** button to return to the Live Data Menu screen to select another data type.
   - If desired, press and hold the **LD** button to display the Live Data Menu (see Live Data Mode on page 41 for details).

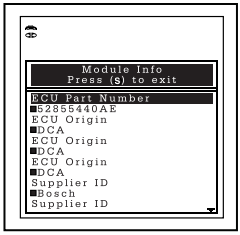
SYSTEM TEST

The System Test function lets you view module information for the vehicle under test.

1. While linked to the vehicle, press and release the **SYSTEM TEST** Ⓢ button.
   - The System Test menu displays.



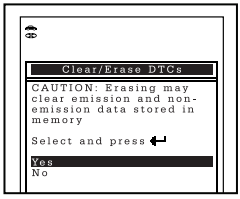
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the information you wish to view, then press the **ENTER** ↵ button.
   - The System Information screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired selection, then press the **ENTER** ↵ button.
4. To exit the enhanced mode, press the **POWER/LINK** ⏻ button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).



ERASING ENHANCED DATA

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

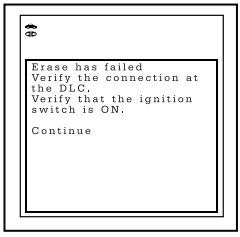
1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 51 and select the system from which you wish to erase data from the Available Systems screen.
   - The DTCs and Related Functions screen displays.
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase Information**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.



   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.
   - If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.
4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.
5. If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.

- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.

Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.



YOUR VEHICLE'S COMPUTER SYSTEM

Today's vehicles are equipped with computer self-testing abilities that can locate problems in your vehicle and store them as Diagnostic Trouble Codes (DTC's) in the vehicle's onboard computer. The Tool allows you access to the computer's memory and retrieves the DTC's.

VEHICLES COVERED

This Tool may be used to retrieve engine service codes from most General Motors (GM) domestic cars and trucks (EXCEPT Geo, Nova, Saturn and Sprint).

Model Year	Make	Model
1982-93	Buick	Century, Electra, Electra Wagon, Estate Wagon, Le Sabre, Le Sabre Wagon, Park Avenue, Reatta, Regal, Grand National, Riviera, Roadmaster, Skyhawk, Skylark, Somerset
	Cadillac	De Ville, El Dorado, Fleetwood, Seville
	Chevrolet	Berreta, Camaro, Caprice, Cavalier, Celebrity, Chevette, Citation, Corisca, Corvette, El Camino, Impala, Lumina, Monte Carlo
	Oldsmobile	Achieva, Calais, Custom Cruiser, Cutlass Calais, Ciera, Cutlass Cruiser, Cruiser Wagon, Cutlass Supreme, Supreme Classic, Delta 88, Eighty-eight, Firenze, Ninety-eight, Omega, Toronado, Touring Sedan, Trofeo
	Pontiac	6000, 6000 STE, Bonneville, Fiero, Firebird, Grand Am, Grand Prix, J 2000, Lemans, J Parisienne, Phoenix, Safari, Safari Wagon, Sunbird, T 1000
	Trucks and Vans	All one ton capacity or less with gas engines
1994	Buick	Roadmaster 5.7 liter
	Chevrolet	Camaro 3.4 liter/5.7 liter, Caprice 5.7 liter, Caprice 5.7 liter, Cavalier 3.1 liter, Lumina 3.1 liter
	Pontiac	Firebird 3.4 liter/5.7 liter, Sunbird 2.0 liter/ 3.1 liter
	Trucks and Vans	All one ton capacity or less with gas engines
1995	Chevrolet	Caprice 4.3 liter
	Trucks and Vans	All one ton capacity or less with gas engines (EXCEPT S/T Series vehicles)

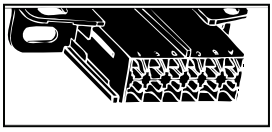
In addition to the list on the previous page, this Tool IS ALSO COMPATIBLE with OBD1 GM models that are equipped with "Climate Control Computers".

For 1994 and 1995 vehicles, only the models listed above are compatible with the Tool.

ABOUT THE TOOL

The Tool is a device that connects to your vehicle's Data Link Connector to retrieve any Diagnostic Trouble Codes that are stored in the vehicle's on-board computer.

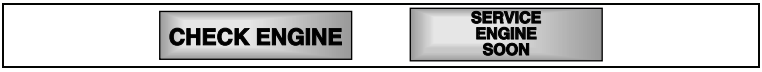
DATA LINK CONNECTOR (DLC)



Your vehicle test connector is known as the Assembly Line Data Link (ALDL) connector, Assembly Line Communication Link (ALCL) Connector or the Data Link Connector (DLC). The GM DLC connector contains 12 pins and is usually black in color. On most GM vehicles, the connector is found under the left side of the dashboard.

MALFUNCTION INDICATOR LIGHT (MIL)

Your vehicle's instrument panel has a Malfunction Indicator Light (MIL) also called the "Check Engine" or "Service Engine soon" light. The MIL is an indicator to warn the vehicle operator of a problem in the computer control system.



If your instrument panel indicator lights do not come on when you turn on the ignition, please refer to your vehicle's service manual. You may have problems in the vehicle's circuitry.

DIAGNOSTIC TROUBLE CODES (DTC's)

The service codes are also called "fault codes", "Diagnostic Trouble Codes" (DTC's) or "trouble codes". These codes can be used to identify systems or components that are malfunctioning. The computer records codes for two types of problems:

- **"Hard" Diagnostic Trouble Codes**

  "Hard" DTCs represent problems that are occurring now and cause the instrument panel Malfunction Indicator Lamp (MIL) or Check Engine light to illuminate and remain on until the failure is repaired. A DTC is stored in the vehicle's computer memory for each fault detected. A Tool or Scanner can be used to retrieve DTCs that are stored in the vehicle's computer memory.

- **Intermittent/History DTCs**

  Intermittent/History DTCs are stored in the computer's memory for problems that occur intermittently, or for problems that happened in the past but are not currently present. Intermittent DTCs may cause the Malfunction Indicator light to flicker or stay on until the intermittent malfunction goes away. However, the corresponding fault code will be stored in memory as a history DTC. If the malfunction that caused the history DTC to set does not recur within a predetermined length of time (usually within 40-80 ignition key start cycles), the computer will automatically erase the related fault code from its memory.

CODE RETRIEVAL PROCEDURE

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

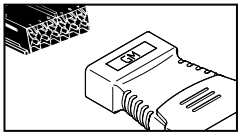
Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

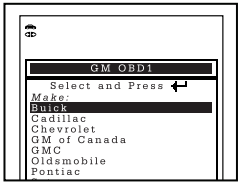
1. Locate the vehicle's Data Link Connector (DLC). See DATA LINK CONNECTOR (DLC) on page 132 for connector location.

Some DLCs have a plastic cover that must be removed before connecting the Tool's cable connector.

2. Connect the Tool cable (with the GM Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ button to turn the Tool ON.

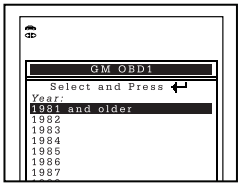


   - The Select Vehicle Make screen displays.



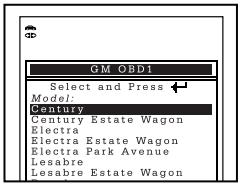
3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the vehicle make, then press the **ENTER** ↵ button to continue.

   - The Select Vehicle Year screen displays.



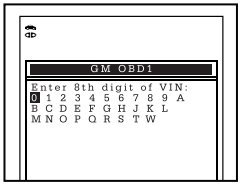
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the vehicle model year, then press the **ENTER** ↵ button to continue.

- The Select Vehicle Model screen displays.



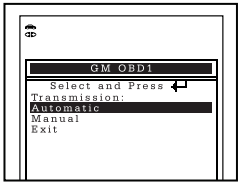
5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the vehicle model, then press the **ENTER** ↵ button to continue.

- The Select 8th digit of VIN screen displays.

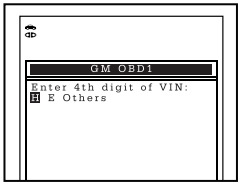


6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the 8th digit of the vehicle's VIN, then press the **ENTER** ↵ button to continue.

*If the Transmission Type screen displays (not applicable to all vehicles), highlight the appropriate transmission type, then press the **ENTER** ↵ button.*

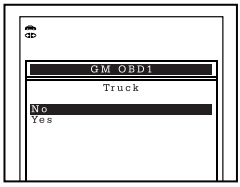


*If the Enter 4th VIN Digit screen displays (not applicable to all vehicles), highlight the 4th digit of the vehicle's VIN, then press the **ENTER** ↵ button.*



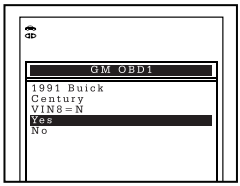
*If the Truck screen displays (not applicable to all vehicles), highlight **Yes** or **No**, as appropriate, then press the **ENTER** ↵ button.*

- A confirmation screen displays. The screen shows the selected year, make and model for the vehicle.

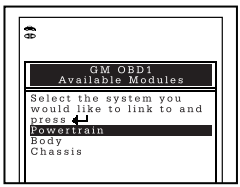


7. If the information shown on the confirmation screen is correct, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to continue.

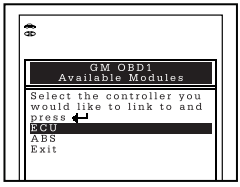
- If the information shown on the confirmation screen is not correct, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Make screen. Repeat steps 3 through 7.



8. The Select System screen displays.

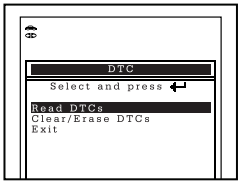


- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button to continue.



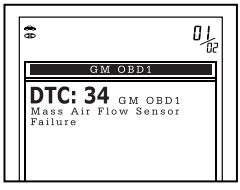
9. The Available Modules screen displays.

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button to continue.



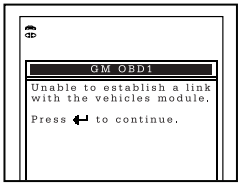
10. The DTC Menu screen displays.

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button to continue.

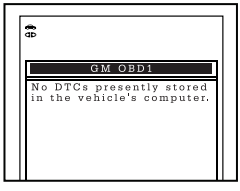


11. The Scan Tool will retrieve and display any Diagnostic Trouble Codes from the vehicle's computer memory.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Press the **POWER/LINK** ⏻ button to return to the Available Modules screen and repeat steps 8 through 10.



- The Tool will display a code only of codes are present in the vehicle's computer memory. If no codes are present, a "No DTC's are presently stored in the vehicle's computer" is displayed.



If the definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's LCD display.

12. If more than one code was retrieved, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional codes.

Code 12 will always be present and it has one of the following meanings:

- If code 12 is the only DTC retrieved and your vehicle "STARTS OK" then code 12 indicates system "PASS" and all computer control systems are functioning properly.

- If code 12 is present and your vehicle "DOES NOT START", then it may indicate a problem with the ignition control system.

13. If desired, press the **LD** button to view OBD1 Live Data (see VIEWING LIVE DATA on page 136 for details).

*The **FF** button is not active when the Scan Tool is connected to an OBD1 vehicle.*

14. Disconnect the Tool from the vehicle and turn the ignition key OFF.

15. To prolong battery life, the Tool automatically shuts "Off" after approximately three minutes with no button activity. The DTCs retrieved will remain in the Tool's memory, and may be viewed at any time. If the Tool's batteries are removed, or if the Tool is re-linked to a vehicle to retrieve codes, any prior codes in its memory are automatically cleared.

16. Follow the testing and repair procedures outlined in the vehicle's service repair manual to correct "hard" DTCs. Codes should be addressed and eliminated in the order they were received, erasing (see ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 139) and retesting after each repair is made to be sure the fault was eliminated. Code 12 will appear alone when no other fault codes are present.

- It may be necessary to test drive the vehicle to reset "hard" fault codes 13, 15, 24, 44, 45, and 55 after they have been erased.

Whenever codes 51, 52, 54, or 55 are displayed with other codes, troubleshoot and eliminate the "50 Series" codes first, then proceed with the lower numbered codes.

The green, yellow and red LEDs are used (with the LCD display) as visual aids to make it easier to determine engine system conditions. See SERVICING DTCs on page 139 for information on interpreting LEDs and servicing DTCs.

VIEWING LIVE DATA

The Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

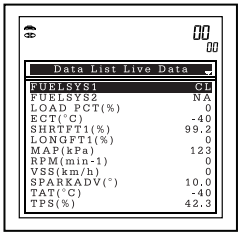
In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.



- The Select PID Group screen displays. The available options depend on the controller to which the Scan Tool is currently linked.

2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired PID group, then press the **ENTER** ↵ button.

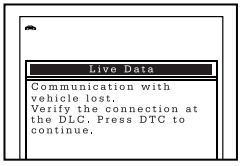
- The LIve Data screen displays.

3. Real-time Live Data (PID) information supported by the vehicle under test displays.

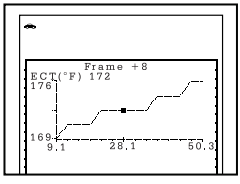
Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.

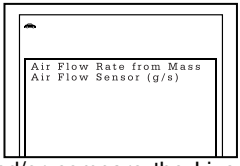
- If communication with the vehicle is lost while viewing Live Data, a Communication Lost" message shows on the Scan Tool's display.



5. Press and release the **ENTER** ↵ button to view the currently selected PID in “graph” mode. Press and release the **ENTER** ↵ button again to return to the PID list.



6. Press and hold the **ENTER** ↵ button to view the "expanded" definition for the currently selected PID. Press and release the **ENTER** ↵ button again to return to the PID list.



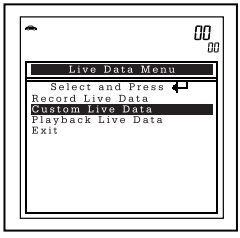
7. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Scan Tool to specifications in the vehicle's repair manual.

If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See ***Customizing Live Data (PIDs)*** *below for details. You may also choose to "capture" (record) Live Data for later viewing. See Live Data Mode on page 41 for details.*

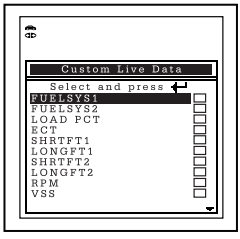
CUSTOMIZING LIVE DATA (PIDs)

This feature lets you customize the Scan Tool display to show only those PIDs that are of interest at the current time. You can customize the Live Data display by placing the Scan Tool in "Custom Live Data" mode and selecting only the PIDs that you wish to display. To customize the Live Data display, proceed as follows:

1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Select PID Group screen displays. The available options depend on the controller to which the Scan Tool is currently linked.
2. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired PID group, then press the **ENTER** ↵ button.
   - The LIve Data screen displays.
3. Press and release the **LD** button.
   - The Custom Live Data menu displays, with the first PID in the menu highlighted.



4. Use the **UP** ▲ and **DOWN** ▼ buttons to scroll through the available PIDs. When the PID you wish to display is highlighted, press the **ENTER** ↵ button to select it (a "checkmark" will show in the checkbox to the right of the PID to confirm your selection). Repeat the procedure until only the PIDs you want to display have all been selected.
   - To deselect a currently selected PID, highlight the PID, then press the **ENTER** ↵ button. The checkmark will be removed from the checkbox.

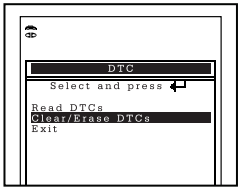


5. When you are finished making your selection(s), scroll to the end of the PID list and highlight the word **DONE**, then press the **ENTER** ↵ button.
   - The Scan Tool is now in "Custom Live Data" mode. Only the PIDs you selected are shown on the Scan Tools display. Pressing the **LD** button repeatedly will toggle between the "full" and "custom" Live Data displays.
6. To exit the "Custom Live Data" mode, press, hold and release the **LD** button, to return to the DTC screen.

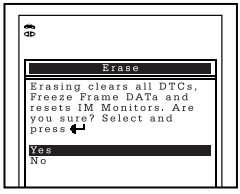
ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 133 and select the controller from which you wish to erase data from the Available Modules screen.
   - The DTC Menu screen displays.

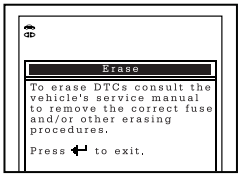


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.
   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.



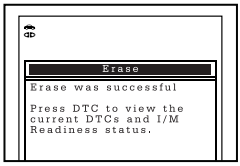
   - If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.

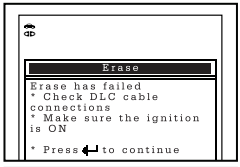
If erasing DTCs using a Scan Tool IS NOT supported by the vehicle, an instructional message displays. Refer to the vehicle's service manual forprocedures to erase DTCs from the vehicle's computer

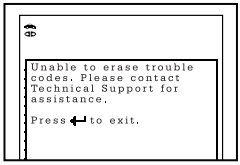

Erase
To erase DTCs consult the vehicle's service manual to remove the correct fuse and/or other erasing procedures.
Press ↵ to exit.

4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

   - If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.
   - If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.
   - If the erase process fails continuously, an advisory message displays. Contact Technical Support for assistance.







Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

SERVICING DTCs

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Retrieved information can be uploaded to a Personal Computer (PC) with the use of optional software. For more information, see instructions included with the optional software.

CODE RETRIEVAL PROCEDURE

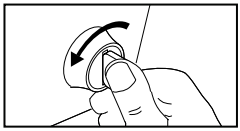
System Selection

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

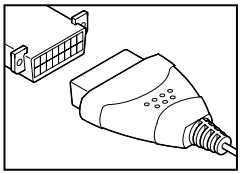
Check the vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Turn the ignition off.
2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 155 for connector location.

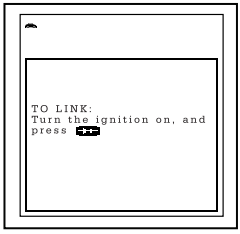


Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.



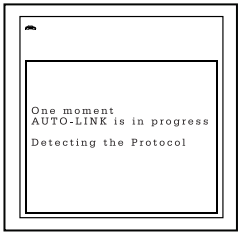
*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*

3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.
   - If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
   - If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.
4. Turn the ignition on. **DO NOT** start the engine.
5. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, the "To Link" screen displays.
   - If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.



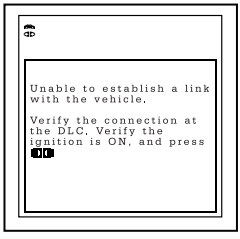
- If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer (PCM) fuse/circuit, and perform any necessary repairs before proceeding.

6. Press the **POWER/LINK** button. The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.



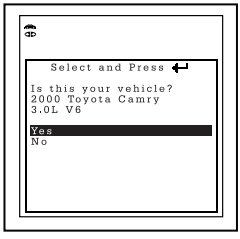
A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 2 for vehicle compliance verification information.

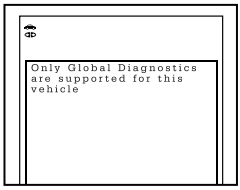


7. Once the vehicle's communication protocol has been determined, the Scan Tool performs a "VIN check" to identify the vehicle.

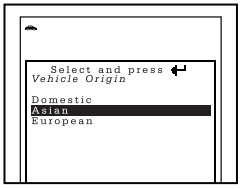
- If the Scan Tool is able to identify the vehicle, the Confirm Vehicle screen displays.
- If the correct vehicle is shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



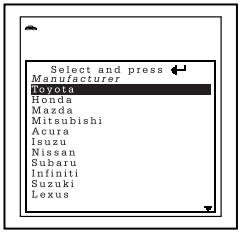
- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 13 to select the type of data you wish to view.
- If enhanced diagnostics *are not supported* by the vehicle, an advisory message shows momentarily on the Scan Tools display.



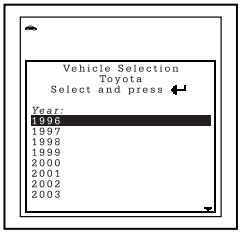
- If the correct vehicle *is not* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button.
  - The Select Vehicle Origin screen displays.



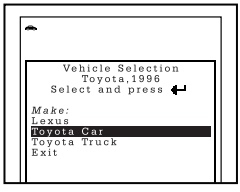
8. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired country of origin, then press the **ENTER** ↵ button.
   - The Select Manufacturer screen displays



9. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Toyota**, then press the **ENTER** ↵ button.
   - The Select Model Year screen displays.



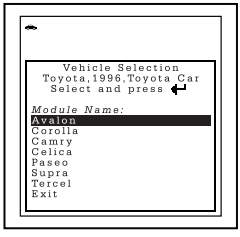
10. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model year, then press the **ENTER** ↵ button.
    - The Select Make screen displays.



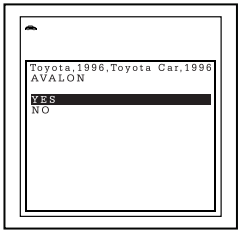
11. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle make, then press the **ENTER** ↵ button.
    - The Select Model screen displays.

12. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired vehicle model, then press the **ENTER** ↵ button.

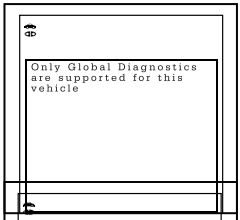
13. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired engine size, then press the **ENTER** ↵ button.
    - The Confirm Vehicle screen displays.



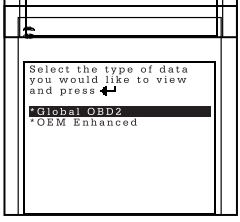
- If the correct vehicle *is* shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button.



- If enhanced diagnostics *are supported* by the vehicle, the Select Data Type screen displays. Proceed to step 14 to select the type of data you wish to view.
- If enhanced diagnostics *are not* supported by the vehicle, an advisory message shows momentarily on the Scan Tools display.
- If the correct vehicle is not shown, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to return to the Select Vehicle Manufacturer screen and re-enter the appropriate vehicle information.

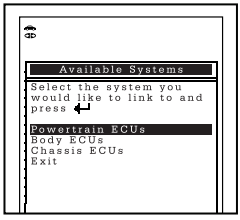


14. If the vehicle supports both Global and enhanced diagnostics, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **OEM Enhanced**, then press the **ENTER** ↵ button.



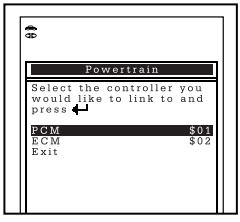
You can return to the Select Data Type screen at any time to revise you selection (as long as the Scan Tool is connected to the vehicle) by pressing ***POWER/LINK*** ⏻ ⊲⊳ *button.*

15. When **OEM Enhanced** is chosen from the Select Data Type screen, the Available Systems screen displays. The screen lists all systems from which you can retrieve data, and shows the current number of DTCs stored for each system.



- The Available Modules screen displays.

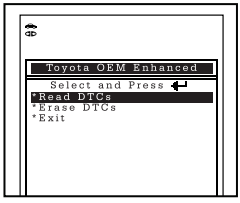
16. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the controller from which you wish to retrieve data, then press the **ENTER** ↵ button.



- If **Powertrain** is selected, refer to Retrieving Powertrain Enhanced Data on page 145 to continue.
- If **Body** is selected, refer to Retrieving Body Enhanced Data on page 146 to continue.
- If **Chassis** is selected, refer to Retrieving Chassis Enhanced Data on page 147 to continue.

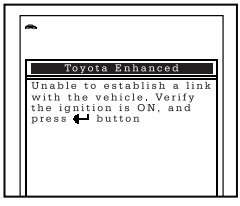
Retrieving Powertrain Enhanced Data

1. When **Powertrain** is selected from the Available System screen and the desired controller is selected from the Available Modules screen, the OEM Enhanced Menu displays.



   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button.

2. A "One moment please . . ." message displays while the Scan Tool retrieves the selected information.

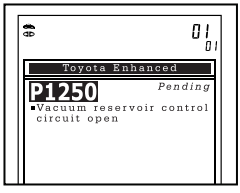


   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

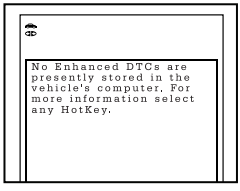
3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.



   - A visible 🚗 icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
   - The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
   - The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.

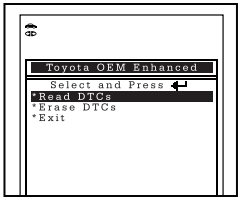


   - The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

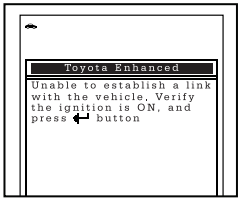
4. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 148 for details).
5. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 149 for details).
6. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information)

Retrieving Body Enhanced Data

1. When **Body** is selected from the Available System screen and the desired controller is selected from the Available Modules screen, the OEM Enhanced Menu displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button.



2. A "One moment please . . ." message displays while the Scan Tool retrieves the selected information.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

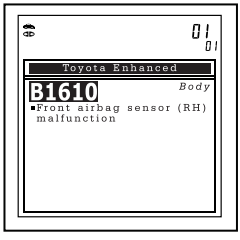


3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

   - A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
   - The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
   - The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.

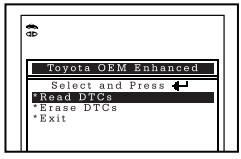


- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

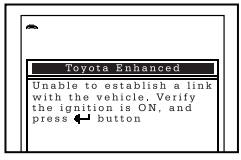
4. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 148 for details).
5. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 149 for details).
6. To exit the enhanced mode, press the **POWER/LINK** ⏻ button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

Retrieving Chassis Enhanced Data

1. When **Chassis** is selected from the Available System screen and the desired controller is selected from the Available Modules screen, the OEM Enhanced Menu displays.
   - Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button.



2. A "One moment please . . ." message displays while the Scan Tool retrieves the selected information.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
     - Verify the ignition is ON, then press the **ENTER** ↵ button to continue. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).



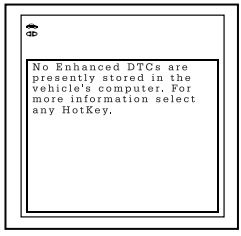
3. To read the display:

Refer to DISPLAY FUNCTIONS on page 13 for a description of LCD display elements.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- The upper right hand corner of the display shows the number of the code currently being displayed and the total number of codes retrieved.
- The Diagnostic Trouble Codes (DTCs) and related code definitions are shown in the lower section of the LCD display.

- Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.
- The Scan Tool will display data only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" message is displayed. Press the **DTC** button to return to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).



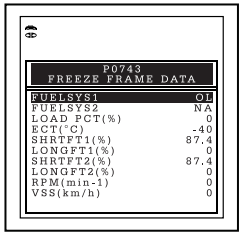
4. If desired, press the **FF** button to view OEM enhanced Freeze Frame data (see VIEWING FREEZE FRAME DATA on page 148 for details).
5. If desired, press the **LD** button to view OEM enhanced Live Data (see VIEWING LIVE DATA on page 149 for details).
6. To exit the enhanced mode, press the **POWER/LINK** ⏻ button. The Scan Tool returns to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

VIEWING FREEZE FRAME DATA

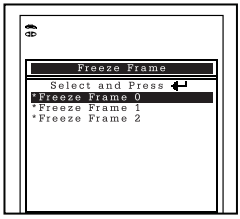
In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data.

When viewing Toyota "enhanced" DTCs, you may also view "enhanced" Freeze Frame data. The vehicle's computer may store multiple Freeze Frames.

1. While viewing Toyota "enhanced" DTCs, press the **FF** button.
   - If a single Freeze Frame has been saved, the Freeze Frame screen displays.

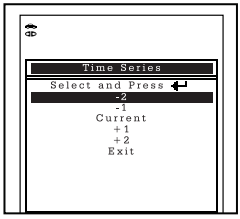


- If more than one Freeze Frame has been saved, a Freeze Frame menu displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the Freeze Frame you wish to view, then press the **ENTER** ↵ button.



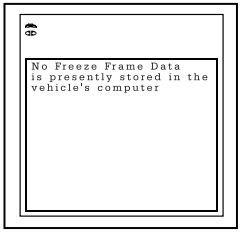
The options available through the Freeze Frame menu differ depending on the vehicle's communication protocol.

- If the vehicle supports saving Freeze Frame data as a "time series," the Time Series screen displays. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the time series ou wish to view, then press the **ENTER** ↵ button.



- Saved engine conditions may include but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate and intake manifold pressure.
- If more than one Freeze Frame was saved, press the **FF** button to return to the Freeze Frame menu to select another Freeze Frame for viewing.

*If no Freeze Frame data is present, the message "No Freeze Frame Data is presently stored in the vehicle's computer" displays. Press the **POWER/LINK** ⏻ button to return to the Select Data Type screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).*



VIEWING LIVE DATA

The Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

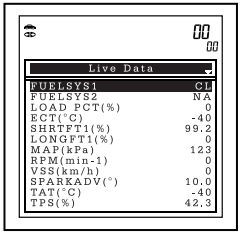
Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

1. While linked to the vehicle, start the engine, then press and release the **LD** button.
   - The Live Data screen displays.
2. Real-time Live Data (PID) information supported by the vehicle under test displays.

Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

3. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to scroll up or down to view all available PID data.



4. To exit the enhanced mode, press the **POWER/LINK** button. The Scan Tool returns to the Enhanced Menu screen (see CODE RETRIEVAL PROCEDURE on page 20 for more information).

ERASING ENHANCED DATA

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

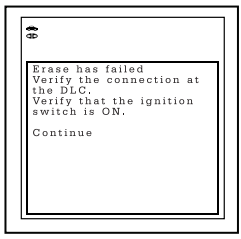
1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)
2. Perform the CODE RETRIEVAL PROCEDURE on page 141 and select the controller from which you wish to erase data from the Available Modules screen.
   - The OEM Enhanced Menu displays.

3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.

- If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.
- If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.

4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

- If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the OEM Enhanced Menu screen.
- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.



Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

ON-BOARD VEHICLE DIAGNOSTICS (OBD1)

- Beginning in 1988, California's Air Resources Board (CARB), and later, the Federal Government's Environmental Protection Agency (EPA), **required** vehicle manufacturers to include a self diagnostic program capable of identifying an emissions-related fault via the vehicles On-Board Computers (some manufacturers used OBD before it was required). The first generation of Onboard Diagnostics came to be known as **OBD I**.
- OBD I is a set of self-testing or self-diagnosing instructions that are programmed into the vehicle's on-board computer.
- The program is specifically designed to detect failures in the sensors, actuators, switches and wiring of the various vehicle emissions-related systems (fuel injection system, ignition system, EGR system, catalytic converter, etc.). If the computer detects a failure in any one of these components or systems, it alerts the driver by illuminating the "Check Engine" light on the dash.
- The computer also assigns a numeric code (OBD I systems utilized a 2 or 3 digit code) for each specific problem that it detects, and stores these codes in it's memory for later retrieval. The codes can be retrieved from the computer's memory with the use of a device called a "Tool" or a "Scan Tool".

*With the exception of some 1994 and 1995 vehicles, most vehicles from about 1982 to 1995 are equipped with **OBD I** systems.*

VEHICLES COVERED

The following tables identify the Toyota and Lexus OBD1 vehicles that are covered by the Scan Tool.

DLC 1 Cars

Year	Model	Eng. Size	Eng. Code	DOHC/ SOHC	Other	DLC Type
1995	Camry Coupe	2.2L	5S-FE	DOHC		1
1992	Camry Sedan	2.2L	5S-FE	DOHC		1
1992	Camry Sedan	3.0L	2VZ-FE	DOHC		1
1993	Camry Sedan	3.0L	3VZ-FE	DOHC		1
1993	Camry Sedan	2.2L	5S-FE	DOHC		1
1994	Camry Sedan	2.2L	5S-FE	DOHC		1
1993	Celica	2.0L	3S-GTE	DOHC	Turbo	1
1993	Celica	2.2L	5S-FE	DOHC		1
1994	Celica	1.8L	7A-FE	DOHC		1
1994	Celica	2.2L	5S-FE	DOHC		1

Year	Model	Eng. Size	Eng. Code	DOHC/ SOHC	Other	DLC Type
1992	Celica Convertible	2.2L	5S-FE	DOHC	A/T	1
1992	Celica Coupe	1.6L	4A-FE	DOHC		1
1992	Celica Coupe	2.2L	5S-FE	DOHC	A/T	1
1993	Celica Coupe	1.6L	4A-FE	DOHC		1
1995	Celica Coupe	1.8L	7A-FE	DOHC		1
1992	Celica Liftback	2.0L	3S-GTE	DOHC	Turbo	1
1992	Celica Liftback	2.2L	5S-FE	DOHC		1
1993	Corolla Sedan	1.6L	4A-FE	DOHC		1
1993	Corolla Sedan	1.8L	7A-FE	DOHC		1
1994	Corolla Sedan	1.6L	4A-FE	DOHC		1
1994	Corolla Sedan	1.8L	7A-FE	DOHC		1
1993	ES-300	3.0L	3VZ-FE	DOHC		1
1993	GS-300	3.0L	2JZ-GE	DOHC		1
1993	LS-400	4.0L	1UZ-FE	DOHC		1
1993	MR2	2.0L	3S-GTE	DOHC	Turbo	1
1993	MR2	2.2L	5S-FE	DOHC		1
1994	MR2	2.0L	3S-GTE	DOHC	Turbo	1
1994	MR2	2.2L	5S-FE	DOHC		1
1994	Paseo	1.5L	5E-FE	DOHC		1
1995	Paseo	1.5L	5E-FE	DOHC		1
1995	SC-300	3.0L	2JZ-GE	DOHC		1
1991	Supra	3.0L	7M-GTE	DOHC	Turbo	1
1991	Supra	3.0L	7M-GE	DOHC		1
1992	Supra	3.0L	7M-GTE	DOHC	Turbo	1
1992	Supra	3.0L	7M-GE	DOHC		1
1993	Tercel Sedan	1.5L	3E-E	SOHC		1
1994	Tercel Sedan	1.5L	3E	SOHC		1

DLC 2 Cars

Year	Model	Eng. Size	Eng. Code	DOHC/ SOHC	Other	DLC Type
1989	Cressida	3.0L	7M-GE	DOHC		2
1990	Cressida	3.0L	7M-GE	DOHC		2
1991	Cressida	3.0L	7M-GE	DOHC		2
1992	Cressida	3.0L	7M-GE	DOHC		2
1993	Camry	3.0L	3VZ-FE	DOHC		2

Year	Model	Eng. Size	Eng. Code	DOHC/ SOHC	Other	DLC Type
1993	Supra	3.0L	2JZ-GTE	DOHC	Turbo	2
1993	Supra	3.0L	2JZ-GE	DOHC		2
1994	Camry	3.0L	3VZ-FE	DOHC		2
1994	Supra	3.0L	2JZ-GTE	DOHC	Turbo	2
1994	Supra	3.0L	2JZ-GE	DOHC		2
1995	Supra	3.0L	2JZ-GTE	DOHC	Turbo	2
1995	Supra	3.0L	2JZ-GE	DOHC		2
1992	SC-300	3.0L	2JZ-GE	DOHC		2
1990	ES-250	2.5L	2VZ-FE	DOHC		2
1991	ES-250	2.5L	2VZ-FE	DOHC		2
1992	ES-300	3.0L	3VZ-FE	DOHC		2
1992	SC-400	4.0L	1UZ-FE	DOHC		2
1991	LS-400	4.0L	1UZ-FE	DOHC		2
1992	LS-400	4.0L	1UZ-FE	DOHC		2
1993	SC-400	4.0L	1UZ-FE	DOHC		2
1994	SC-400	4.0L	1UZ-FE	DOHC		2
1994	SC-300	3.0L	2JZ-GE	DOHC		2
1993	SC-400	4.0L	1UZ-FE	DOHC		2
1994	GS-300	3.0L	2JZ-GE	DOHC		2
1993	SC-300	3.0L	2JZ-GE	DOHC		2

DLC 1 Light Trucks

Year	Model	Eng. Size	Eng. Code	DOHC/ SOHC	Other	DLC Type
1992	Previa	2.4L	2TZ-FE	DOHC		1
1993	Previa	2.4L	2TZ-FE	DOHC		1
1994	Previa	2.4L	2TZ-FE	DOHC		1
1994	T100	3.0L	3VZ-FE	SOHC		1
1995	4 Runner	2.4L	22R-E	SOHC		1
1995	4 Runner	3.0L	3VZ-FE	SOHC		1
1995	Pickup	2.4L	22R-E	SOHC		1
1995	Pickup	3.0L	3VZ-FE	SOHC		1
1995	Previa	2.4L	2TZ-FE	DOHC		1

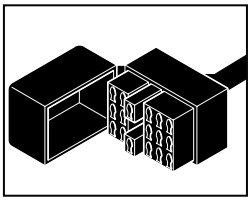
DATA LINK CONNECTOR (DLC)

Toyota vehicles are equipped with special Test Connectors that make it possible to connect specialized testing equipment that communicates with the vehicle's onboard computer. This Tool is designed for use with two types of Toyota DLC connectors; DLC Number 1 and DLC Number 2, as described below.

The Tool's Toyota Connector Cable Adaptor is designed to match the vehicle's DLC. Make sure the adaptor mates properly before applying any force when making the connection. Applying force to the connector when not mated properly may cause damage to the connectors.

1. Type 1 connector is also known as Data Link Connector Number 1. The type 1 DLC connector is a rectangular connector and is usually black or gray in color. The connector is located under the hood (engine compartment) in the following general locations:

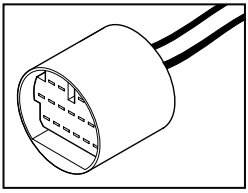
- Front corner (right or left)
- Front corner (right or left)
- Fender well (right or left)
- Fire wall (right or left)



It has a cover labeled "DIAGNOSTIC", "DIAGNOSIS", or "CHECK CONN", Use the square head of the Toyota Connector Cable Adaptor on vehicles with this type of connector.

2. Type 2 connector is also known as Data Link Connector (DLC) Number 2. The type 2 DLC connector is a round connector and is usually black or gray in color.

- The connector is located "under the dash" on the left hand side.



It may have a protective cap that needs to be removed before connecting the Tool's DLC. Use the round head of the Toyota Connector Cable Adaptor on vehicles with this type of connector.

INSTRUMENT PANEL MALFUNCTION INDICATOR LIGHTS (MIL)

Your vehicle's instrument panel has a Malfunction Indicator Light (MIL) also called the "Check Engine" or "Service Engine soon" light. The MIL is an indicator to warn the vehicle operator of a problem in the computer control system.

If your instrument panel indicator lights do not come on when you turn on the ignition, please refer to your vehicle's service manual. You may have problems in the car's circuitry. It is recommended that you fix these problems before retrieving DTCs from your vehicle's computer.

DIAGNOSTIC TROUBLE CODES

Diagnostic Trouble Codes, or Fault Codes, can be used to identify engine systems or components that are malfunctioning. The computer records codes for the following two types of engine problems:

- **"Hard" Diagnostic Trouble Codes**

  "Hard" DTCs represent problems that are occurring now and cause the instrument panel Malfunction Indicator Lamp (MIL) or Check Engine light to illuminate and remain on until the failure is repaired. A DTC is stored in the vehicle's computer memory for each fault detected. A Tool or Scanner can be used to retrieve DTCs that are stored in the vehicle's computer memory.

- **Intermittent/History DTCs**

  Intermittent/History DTCs are stored in the computer's memory for problems that occur intermittently, or for problems that happened in the past but are not currently present. Intermittent DTCs may cause the Malfunction Indicator light to flicker or stay on until the intermittent malfunction goes away. However, the corresponding fault code will be stored in memory as a history DTC. If the malfunction that caused the history DTC to set does not recur within a predetermined length of time (usually within 40-80 ignition key start cycles), the computer will automatically erase the related fault code from its memory.

CODE RETRIEVAL PROCEDURE

Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 18 for details.

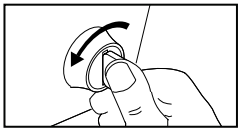
***ALWAYS** observe safety precautions whenever working on a vehicle. See Safety Precautions on page 1 for more information.*

1. Locate the vehicle's Data Link Connector (DLC). See DATA LINK CONNECTOR (DLC) on page 155 for connection location.

Some DLCs have a plastic cover that must be removed before connecting the Tool's cable connector.

2. Connect the Tool cable (with the Toyota Connector Cable Adaptor attached) to the Tool, then connect the adaptor to the vehicle's DLC. Press the **POWER/LINK** ⏻ button to turn the Tool ON.

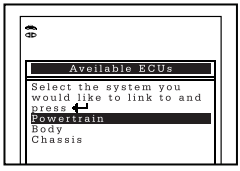
3. Do the following before proceeding to step 4:



- Turn ignition ON and start engine. Warm engine to operating temperature. (Shut engine off after warm up).
- Make sure throttle is closed.
- Set gear lever in "park" (for automatic transmissions) or "neutral" for manual transmissions.
- Turn off all accessories.

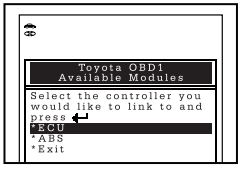
4. Turn ignition ON. DO NOT start the engine. Press the **ENTER** ↵ button to continue.

- The Select System screen displays.



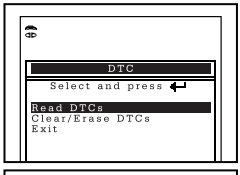
5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired system, then press the **ENTER** ↵ button to continue.

- The Available Modules screen displays.



6. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight the desired controller, then press the **ENTER** ↵ button to continue.

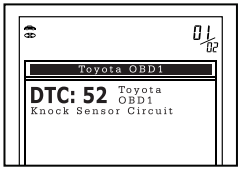
- The DTCs Menu screen displays.

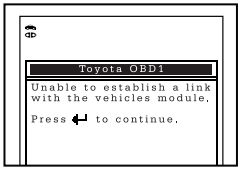


7. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Read DTCs**, then press the **ENTER** ↵ button to continue.

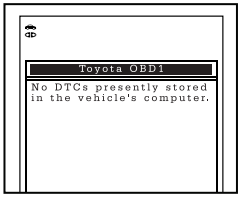
8. The Scan Tool will retrieve and display any Diagnostic Trouble Codes from the vehicle's computer memory.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Press the **POWER/LINK** ⏻ button to return to the Available Modules screen and repeat steps 8 through 10.

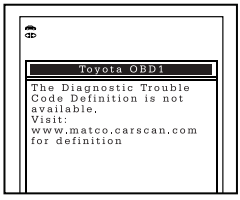




- The Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No DTC' are presently stored in the vehicle's computer" message is displayed.



If the definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's LCD display.



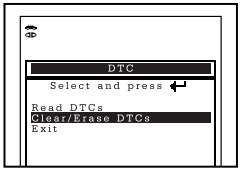
9. If more than one code was retrieved, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the additional codes.
10. Disconnect the Tool from the vehicle and turn the ignition key OFF.
11. To prolong battery life, the Tool automatically shuts "Off" after approximately three minutes with no button activity. The DTCs retrieved will remain in the Tool's memory, and may be viewed at any time. If the Tool's batteries are removed, or if the Tool is re-linked to a vehicle to retrieve codes, any prior codes in its memory are automatically cleared.
12. Follow the testing and repair procedures outlined in the vehicle's service repair manual to correct "hard" DTCs. Codes should be addressed and eliminated in the order they were received, erasing (see ERASING DIAGNOSTIC TROUBLE CODES (DTCs) on page 158) and retesting after each repair is made to be sure the fault was eliminated.

The green, yellow and red LEDs are used (with the LCD display) as visual aids to make it easier to determine engine system conditions. See SERVICING DTCs on page 159 for information on interpreting LEDs and servicing DTCs.

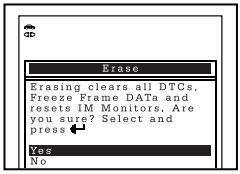
ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory.

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 3. If not, continue to step 2.)



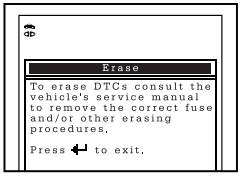
2. Perform the CODE RETRIEVAL PROCEDURE on page 156 and select the controller from which you wish to erase data from the Available Modules screen.
   - The DTC Menu screen displays.



3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Clear / Erase DTCs**, then press the **ENTER** ↵ button. A confirmation message shows on the LCD display.

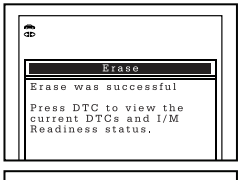
   - If you are sure you want to proceed, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **Yes**, then press the **ENTER** ↵ button to erase data from the vehicle's computer.
   - If you do not want to continue with the erase process, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to highlight **No**, then press the **ENTER** ↵ button to exit the erase mode.

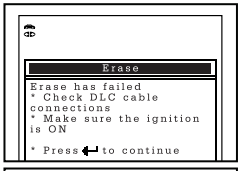
If erasing DTCs using a Scan Tool IS NOT supported by the vehicle, an instructional message displays. Refer to the vehicle's service manual forprocedures to erase DTCs from the vehicle's computer

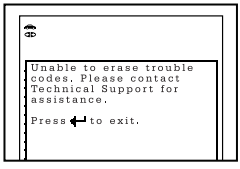

Erase
To erase DTCs consult the vehicle's service manual to remove the correct fuse and/or other erasing procedures.
Press ↵ to exit.

4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

   - If the erase was successful, a confirmation message shows on the display. Press the **DTC** button to return to the DTCs and Related Functions screen.
   - If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.
   - If the erase process fails continuously, an advisory message displays. Contact Technical Support for assistance.







Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

SERVICING DTCs

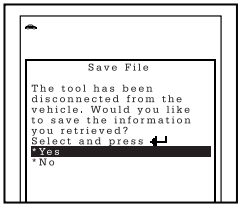
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Retrieved information can be uploaded to a Personal Computer (PC) with the use of optional software. For more information, see instructions included with the optional software.

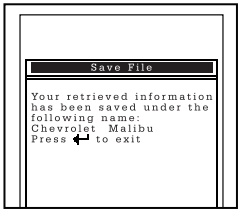
SAVING DATA TO MEMORY

You can save data retrieved from a vehicle to the Scan Tool's internal memory for recall and viewing at a later time. The Scan Tool can store 36 data files in memory, with a maximum of six data files (three "global" files and three "enhanced" files) for any given code retrieval session.

1. When you disconnect the Scan Tool from a vehicle, the Save File screen displays, prompting you to save the retrieved data to the Scan Tool's internal memory.


Save File
The tool has been disconnected from the vehicle. Would you like to save the information you retrieved?
Select and press
*Yes
*No

2. If you do wish to save retrieved data to the San Tool's memory, use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select Yes from the Save File screen, then press the **ENTER** ↵ button.



   - A confirmation screen displays. The screen shows the file name (vehicle make and model) under which the data will be saved. Press the **ENTER** ↵ button to save the data files to the Scan Tool's internal memory.

*If sufficient memory is not available to save the data file, a list of files currently stored in the Scan Tool's memory display. You must delete a file from memory in order to save the new data file. use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the file you wish to delete, then press the **ENTER** ↵ button to delete the selected file and save the new file to memory.*

3. The Scan Tool enter the "memory" mode. (see VIEWING DATA IN MEMORY on page 161).

VIEWING DATA IN MEMORY

To view DTC's and other diagnostic data stored in the Scan Tool's memory, do the following:

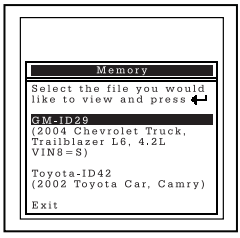
To view data for OBD2 vehicles:

1. With no DLC cable connected to the Scan Tool, press the **POWER/LINK** ⏻ button to turn the Scan Tool "on."

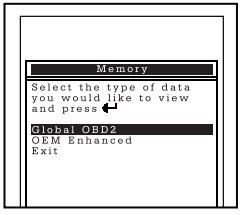
   - The screen shows the "To Link" message.

2. Press the **ENTER** ↵ button to view data stored in the Scan Tool's memory.

- The Select Vehicle screen displays. The screen shows a list of all vehicles for which data has been saved in the Scan Tool's memory.

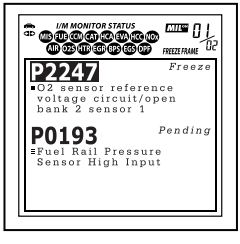


3. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired OBD2 vehicle, then press the **ENTER** ↵ button.
   - The Select Data Type screen displays.



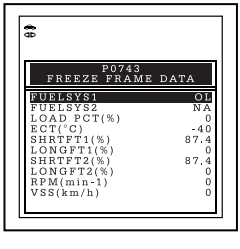
4. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the type of data you wish to view, **Global OBD2** or **OEM Enhanced**, then press the **ENTER** ↵ button.
   - If **Global OBD2** is selected and *multiple data* files have been saved for the vehicle, or if **OEM Enhanced** is selected, the Select Data File screen displays. The screen shows an identifier for the selected vehicle and a list of available data files. Proceed to step 5.
   - If **Global OBD2** is selected and a *single* data file has been saved for the vehicle, the DTC screen displays. Proceed to step 6.

5. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to select the desired data file, then press the **ENTER** ↵ button.
   - The DTC screen displays.
6. The DTC screen shows all codes saved in the selected data file, along with definitions for each code. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.



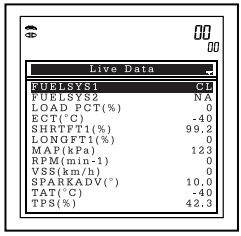
If no DTCs were retrieved, an advisory message shows on the Scan Tool's display. Press the ***POWER.LINK*** ⏻ ◁▷ *button to turn the Scan Tool off, then repeat steps 1 thorough 5 to select another data file.*

7. To view additional data:
   - Press the **FF** button to view Freeze Frame data.



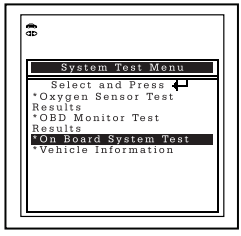
If Freeze Frame data is not available, an advisory message shows on the Scan Tool's display. Press the **DTC** *button to return to the DTC screen.*

- Press the **LD** button to view Live Data. Press the **POWER.LINK** button to turn the Scan Tool off, then repeat steps 1 thorough 5 to select another data file.



If Live Data is not available, an advisory message shows on the Scan Tool's display. Press the **DTC** *button to return to the DTC screen.*

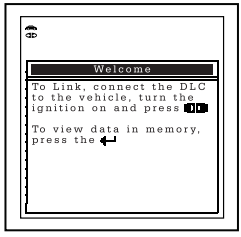
- Press the **SYSTEM TEST** button to view System Test results.

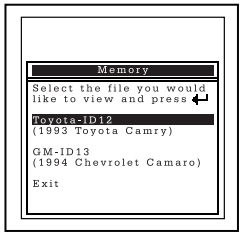


8. To view data for another vehicle, press the **POWER.LINK** button to turn the Scan Tool off, then repeat steps **1** thorough **5** to select another data file.
9. When you have finished viewing data in memory, press the **POWER/LINK** button to turn the Scan Tool "off."

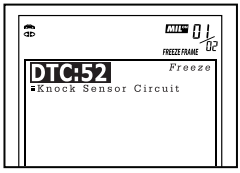
To view data for OBD1 vehicles:

1. With no DLC cable connected to the Scan Tool, press the **POWER/LINK** button to turn the Scan Tool "on."
   - The screen shows the "To Link" message.
2. Press the **ENTER** button to view data stored in the Scan Tool's memory.
   - The Select Vehicle screen displays. The screen shows a list of all vehicles for which data has been saved in the Scan Tool's memory.
3. Use the **UP** and **DOWN** buttons, as necessary, to select the desired OBD1 vehicle, then press the **ENTER** button.





- The DTC screen displays.

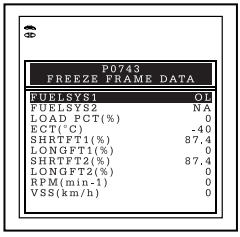


4. The DTC screen shows all codes saved in the selected data file, along with definitions for each code. Use the **UP** ▲ and **DOWN** ▼ buttons, as necessary, to view the entire list.

If no DTCs were retrieved, an advisory message shows on the Scan Tool's display. Press the ***POWER.LINK*** ⏻ ⊲⊳ *button to turn the Scan Tool off, then repeat steps 1 thorough 5 to select another data file.*

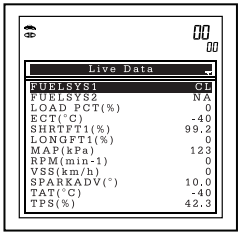
5. To view additional data:

- Press the **FF** button to view Freeze Frame data.



If Freeze Frame data is not available, an advisory message shows on the Scan Tool's display. Press the **DTC** *button to return to the DTC screen.*

- Press the **LD** button to view Live Data. Press the **POWER.LINK** ⏻ ⊲⊳ button to turn the Scan Tool off, then repeat steps 1 thorough 5 to select another data file.



If Live Data is not available, an advisory message shows on the Scan Tool's display. Press the **DTC** *button to return to the DTC screen.*

6. To view data for another vehicle, press the **POWER.LINK** ⏻ ⊲⊳ button to turn the Scan Tool off, then repeat steps 1 thorough 5 to select another data file.

7. When you have finished viewing data in memory, press the **POWER/LINK** ⏻ ⊲⊳ button to turn the Scan Tool "off."

The following is a list of Generic (Global) PIDs and their descriptions.

Tool Display	Unit	Value	PID Description
ACC Pedal D	%	XXX.X	Accelerator Pedal Position D
ACC Pedal E	%	XXX.X	Accelerator Pedal Position E
ACC Pedal F	%	XXX.X	Accelerator Pedal Position F
Air Status	-	UPS, DNS, OFF	Commanded Secondary Air Status
Ambient	*C / *F	XXX	Ambient Air Temperature
Aux Input Status	-	On / Off	Auxiliary Input Status
BARO	kPa /inHg	XXX / XX.X	Barometric Pressure
Calc LOAD	%	XXX.X	Calculated LOAD Value
CAT Temp 11	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 1
CAT Temp 12	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 2
CAT Temp 21	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 1
CAT Temp 22	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 2
Command EGR	%	XXX.X	Commanded EGR
Command EVAP	%	XXX.X	Commanded Evaporative Purge
Command TAC	%	XXX.X	Commanded Throttle Actuator
Dist DTC Clr	km /mile	XXXXX	Distance since DTC Cleared
Dist MIL ON	km /miles	XXXXX	Distance Traveled while MIL ON
ECT	*C / *F	XXX / XXX	Engine Coolant Temp
ECU Volts	V	XX.XXX	Control Module Voltage
EGR Error	%	XXX.X	EGR Error
Eng RPM	min	XXXXX	Engine RPM
EQ Ratio	-	X.XXX	Commanded Equivalence Ratio
EQ Ratio 11	-	X.XXX	Bank 1 - Sensor 1 Equivalence Ratio
EQ Ratio 12	-	X.XXX	Bank 1 - Sensor 2 Equivalence Ratio
EQ Ratio 13	-	X.XXX	Bank 1 - Sensor 3 Equivalence Ratio

Tool Display	Unit	Value	PID Description
EQ Ratio 14	-	X.XXX	Bank 1 - Sensor 4 Equivalence Ratio
EQ Ratio 21	-	X.XXX	Bank 2 - Sensor 1 Equivalence Ratio
EQ Ratio 22	-	X.XXX	Bank 2 - Sensor 2 Equivalence Ratio
EQ Ratio 23	-	X.XXX	Bank 2 - Sensor 3 Equivalence Ratio
EQ Ratio 24	-	X.XXX	Bank 2 - Sensor 4 Equivalence Ratio
EVAP Press	Pa /in H2O	XXXX.XX /XX.XXX	Evap System Vapor Pressure
FP / Vac	kPa /PSI	XXXX.XXX /XXX.X	Fuel Rail Pressure relative toVacuum
Fuel Level	%	XXX.X	Fuel Level Input
Fuel Press	kPa /PSI	XXX / XX.X	Fuel Rail Pressure
Fuel Press	kPa /PSI	XXXXX /XXXX.X	Fuel Rail Pressure
Fuel Sys 1	-	OL	Fuel System 1 Status
Fuel Sys 1	-	CL	Fuel System 1 Status
Fuel Sys 1	-	OL-Drive	Fuel System 1 Status
Fuel Sys 1	-	OL-Fault	Fuel System 1 Status
Fuel Sys 1	-	CL-Fault	Fuel System 1 Status
Fuel Sys 2	-	OL	Fuel System 2 Status
Fuel Sys 2	-	CL	Fuel System 2 Status
Fuel Sys 2	-	OL-Drive	Fuel System 2 Status
Fuel Sys 2	-	OL-Fault	Fuel System 2 Status
Fuel Sys 2	-	CL-Fault	Fuel System 2 Status
IAT	*C / *F	XXX / XXX	Intake Air Temperature
LOAD Value	%	XXX.X	Absolute Load Value
LTFT B1	%	XXX.X	Long Term Fuel Trim-Bank 1
LTFT B2	%	XXX.X	Long Term Fuel Trim-Bank 2
LTFT B3	%	XXX.X	Long Term Fuel Trim-Bank 3
LTFT B4	%	XXX.X	Long Term Fuel Trim-Bank 4
MAF	g/s ;l b/min	XXX.XX /XXXX.X	Air Flow Rate from Mass Air Flow Sensor
MAP	kPa /PSI	XXX / XX.X	Intake Manifold Absolute Pressure
MIL On Time	hrs, min	XXXX, XX	Engine Run Time while MIL ON
Monitor Status	-	ICONS on Display	Monitor Status this Driving Cycle
O2S B1 S1	V	X.XXX	Bank 1 - Sensor 1

Tool Display	Unit	Value	PID Description
O2S B1 S1 mA	mA	X.XXX	Bank 1 - Sensor 1 O2S Current
O2S B1 S1 V	V	X.XXX	Bank 1 - Sensor 1 O2S Voltage
O2S B1 S2	V	X.XXX	Bank 1 - Sensor 2
O2S B1 S2 mA	mA	X.XXX	Bank 1 - Sensor 2 O2S Current
O2S B1 S2 V	V	X.XXX	Bank 1 - Sensor 2 O2S Voltage
O2S B1 S3	V	X.XXX	Bank 1 - Sensor 3
O2S B1 S3 mA	mA	X.XXX	Bank 1 - Sensor 3 O2S Current
O2S B1 S3 V	V	X.XXX	Bank 1 - Sensor 3 O2S Voltage
O2S B1 S4	V	X.XXX	Bank 1 - Sensor 4
O2S B1 S4 mA	mA	X.XXX	Bank 1 - Sensor 4 O2S Current
O2S B1 S4 V	V	X.XXX	Bank 1 - Sensor 4 O2S Voltage
O2S B2 S1	V	X.XXX	Bank 2 - Sensor 1
O2S B2 S1 mA	mA	X.XXX	Bank 2 - Sensor 1 O2S Current
O2S B2 S1 V	V	X.XXX	Bank 2 - Sensor 1 O2S Voltage
O2S B2 S2	V	X.XXX	Bank 2 - Sensor 2
O2S B2 S2 mA	mA	X.XXX	Bank 2 - Sensor 2 O2S Current
O2S B2 S2 V	V	X.XXX	Bank 2 - Sensor 2 O2S Voltage
O2S B2 S3	V	X.XXX	Bank 2 - Sensor 3
O2S B2 S3 mA	mA	X.XXX	Bank 2 - Sensor 3 O2S Current
O2S B2 S3 V	V	X.XXX	Bank 2 - Sensor 3 O2S Voltage
O2S B2 S4	V	X.XXX	Bank 2 - Sensor 4
O2S B2 S4 mA	mA	X.XXX	Bank 2 - Sensor 4 O2S Current
O2S B2 S4 V	V	X.XXX	Bank 2 - Sensor 4 O2S Voltage
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S13	Oxygen Sensor, Bank 1, Sensor 3
O2S Location	-	O2S14	Oxygen Sensor, Bank 1, Sensor 4
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S23	Oxygen Sensor, Bank 2, Sensor 3
O2S Location	-	O2S24	Oxygen Sensor, Bank 2, Sensor 4
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 2
O2S Location	-	O2S31	Oxygen Sensor, Bank 3, Sensor 1
O2S Location	-	O2S32	Oxygen Sensor, Bank 3, Sensor 2
O2S Location	-	O2S41	Oxygen Sensor, Bank 4, Sensor 1

Tool Display	Unit	Value	PID Description
O2S Location	-	O2S42	Oxygen Sensor, Bank 4, Sensor 2
OBD Support	-	OBD2	OBD Requirements
OBD Support	-	OBD	OBD Requirements
OBD Support	-	OBD and OBD2	OBD Requirements
OBD Support	-	OBD1	OBD Requirements
OBD Support	-	No OBD	OBD Requirements
OBD Support	-	EOBD	OBD Requirements
OBD Support	-	EOBD and OBD2	OBD Requirements
OBD Support	-	EOBD and OBD	OBD Requirements
OBD Support	-	EOBD, OBD and OBD2	OBD Requirements
OBD Support	-	JOBD	OBD Requirements
OBD Support	-	JOBD and OBD2	OBD Requirements
OBD Support	-	JOBD and EOBD	OBD Requirements
OBD Support	-	JOBD, EOBD and OBD2	OBD Requirements
PTO Status	-	On / Off	Power Take Off Status
Rel TPS	%	XXX.X	Relative Throttle Position
Spark Adv	deg	XX	Ignition Timing Advance #1 Cylinder
STFT B1	%	XXX.X	Short Term Fuel Trim-Bank 1
STFT B1 S1	%	XXX.X	Bank 1 - Sensor 1
STFT B1 S2	%	XXX.X	Bank 1 - Sensor 2
STFT B1 S3	%	XXX.X	Bank 1 - Sensor 3
STFT B1 S4	%	XXX.X	Bank 1 - Sensor 4
STFT B2	%	XXX.X	Short Term Fuel Trim-Bank 2
STFT B2 S1	%	XXX.X	Bank 2 - Sensor 1
STFT B2 S2	%	XXX.X	Bank 2 - Sensor 2
STFT B2 S3	%	XXX.X	Bank 2 - Sensor 3
STFT B2 S4	%	XXX.X	Bank 2 - Sensor 4
STFT B3	%	XXX.X	Short Term Fuel Trim-Bank 3
STFT B4	%	XXX.X	Short Term Fuel Trim-Bank 4
Time DTC Clr	hrs, min	XXXX, XX	Time since DTC Cleared
Time Since Start	sec	XXXX	Time Since Engine Start
TPS	%	XXX.X	Absolute Throttle Position
TPS B	%	XXX.X	Absolute Throttle Position B
TPS C	%	XXX.X	Absolute Throttle Position C

Tool Display	Unit	Value	PID Description
Veh Speed	km/h / mph	XXX / XXX	Vehicle Speed Sensor
Warm-up DTC Clr	-	XXX	# Warm-ups since DTC Cleared

GLOSSARY OF TERMS AND ABBREVIATIONS

CARB – California Air Resources Board

CCM – Central Control Module

Computer Control System – An electronic control system, consisting of an on-board computer and related sensors, switches and actuators, used to ensure peak performance and fuel efficiency while reducing pollutants in the vehicle's emissions.

DIY – Do-It-Yourself

DLC – Data Link Connector

Drive Cycle – An extended set of driving procedures that takes into consideration the various types of driving conditions encountered in real life.

Driving Condition – A specific environmental or operation condition under which a vehicle is operated; such as starting the vehicle when cold, driving at steady speed (cruising), accelerating, etc.

DTC(s) – Diagnostic Trouble Code(s)

EGR – Exhaust Gas Recirculation

EPA – Environmental Protection Agency

EVAP – Evaporative Emissions System

Fault Code – See DTCs

Freeze Frame – A digital representation of engine and/or emissions system conditions present when a fault code was recorded.

FTP – Fuel Tank Pressure

Generic Code – A DTC that applies to all OBD2 compliant vehicles.

I/M Readiness – An indication of whether or not a vehicle's emissions-related system are operating properly and are ready for Inspection and Maintenance testing.

I/M Test / Emissions Test / Smog Check – A functional test of a vehicle to determine if tailpipe emissions are within Federal/State/Local requirements.

LCD – Liquid Crystal Display

LED – Light Emitting Diode

LTFT – Long Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio (long term).

Manufacturer Specific Code – A DTC that applies only to OBD2 compliant vehicles made by a specific manufacturer.

MIL – Malfunction Indicator Lamp (also referred to as "Check Engine" light

OBD1 – On-Board Diagnostics Version 1 (also referred to as "OBD I")

OBD2 – On-Board Diagnostics Version 2 (also referred to as "OBD II")

On-Board Computer – The central processing unit in the vehicle's computer control system.

PCM – Powertrain Control Module

Pending Code – A code recorded on the "first trip" for a "two-trip" code. If the fault that caused the code to be set is not detected on the second trip, the code is automatically erased.

PID – Parameter Identification

STFT – Short Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio. The vehicle uses this program to make minor fuel adjustments (fine tune) on a short-term basis.

Trip Drive Cycle – Vehicle operation that provides the necessary driving condition to enable a vehicle Monitor to run and complete its diagnostic testing.

VECI – Vehicle Emission Control Information Decal

LIMITED ONE YEAR WARRANTY

The Manufacturer warrants to the original purchaser that this unit is free of defects in materials and workmanship under normal use and maintenance for a period of one (1) year from the date of original purchase.

If the unit fails within the one (1) year period, it will be repaired or replaced, at the Manufacturer's option, at no charge, when returned prepaid to the Service Center with Proof of Purchase. The sales receipt may be used for this purpose. Installation labor is not covered under this warranty. All replacement parts, whether new or remanufactured, assume as their warranty period only the remaining time of this warranty.

This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage, service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than the Manufacturer's Service Center.

The Manufacturer, under no circumstances shall be liable for any consequential damages for breach of any written warranty of this unit. This warranty gives you specific legal rights, and you may also have rights, which vary from state to state. This manual is copyrighted with all rights reserved. No portion of this document may be copied or reproduced by any means without the express written permission of the Manufacturer. THIS WARRANTY IS NOT TRANSFERABLE. For service, send via U.P.S. (if possible) prepaid to Manufacturer. Allow 3-4 weeks for service/repair.

SERVICE PROCEDURES

If you have any questions, require technical support or information on UPDATES and OPTIONAL ACCESSORIES, please contact your local store, distributor or the Service Center.

(877) 336-2826 (33-MATCO) (6:00 AM-6:00 PM, Monday-Saturday PST)

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